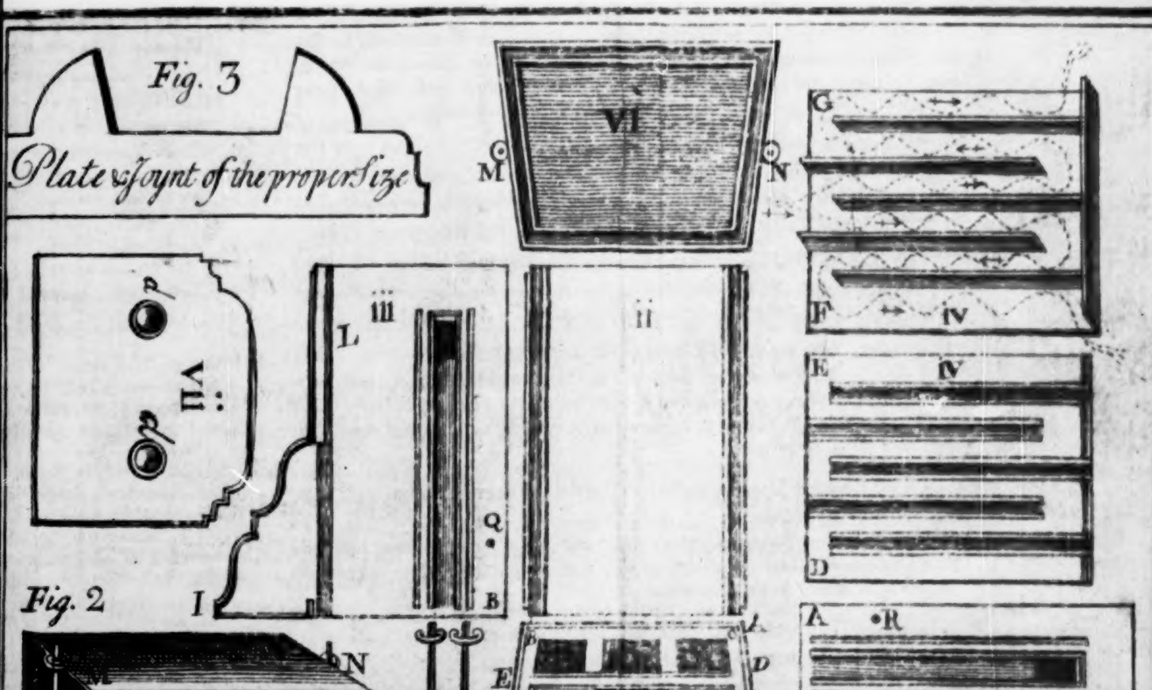
the magazine of STANDARDS



.. decimal inch ... page 101

APRIL 1961

the magazine of STANDARDS

Standardization is dynamic, not static. It means not to stand still, but to move forward together.

Vol. 32 No. 4 April, 1961

FEATURES

NEWS

DEPARTMENTS

Opinions expressed by authors in THE MAGAZINE OF STANDARDS are not necessarily those of the American Standards Association.

Published monthly by the American Standards Association, Incorporated, 10 East 40th Street, New York 16, N. Y.

Subscription rates: Companies in U. S. and possessions, $7.00 per year; in other countries, $8.00. Public libraries, schools, and government agencies, in U. S. and possessions, $6.00 per year; in other countries, $7.00. Single copy 60 cents. Re-entered as second class matter Jan. 25, 1954, at the Post Office, New York, N. Y., under the Act of March 3, 1879. Indexed in the Engineering Index and the Industrial Arts Index. Microfilm copies can be obtained from University Microfilms, Ann Arbor, Mich.

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ASA

THE COVER: Interest in the decimalized inch, as indicated in the articles on pages 101 and 126, has called attention to the early use of a decimalized inch by Benjamin Franklin. The drawing on the cover is one made by Franklin showing the design of his new-type stove—new in 1764. The scale in the lower right-hand corner is in decimals.

Pennsylvania Historical Society

• When a standards man needs help in solving some stubborn problem, what does he do? If his company is a member of the American Standards Association, one of the most fruitful things he can do is to attend a meeting of ASA's Company Member Conference. CMC meetings – one in the Spring and one in the Fall, the latter during the National Conference on Standards – are fast becoming recognized as an unusually valuable means for exchange of standards information and ideas. It is no surprise to those who have attended CMC meetings that one company's or industry's solution of a standards problem can frequently be adapted to solve a similar problem in another company or industry.

notes

Last year's Spring meeting of the CMC brought forth an interesting collection of papers on how to start and operate a standards department. This series, published in THE MAGAZINE OF STANDARDS, has been reprinted in a booklet entitled *Ideas for a Company Standards Program.*

But the papers alone give no idea of the stimulating exchange of questions and answers that took place in the work groups.

The Spring meeting this year is being held in Chicago, June 1 and 2 (see program, page 110).

If your company is not yet a member of the Company Member Conference, send the name of your representative to the American Standards Association, attention Henry G. Lamb.

• Use of computers—an important factor in the problem of the decimal inch (see pages 101 and 126)—increased from 816 computers in 1957 to 4,927 at the beginning of 1961, with 6,453 on order to be delivered within 1961-62. This was reported by *Data Processing* magazine as the result of a computer census. Uses of these machines range from plane reservations to designing other computers, from production control to accounting, and new programs are being devised constantly.

This Month's Standards Personality

George H. Harnden

A PIONEER WHO HAS BUILT UP an imposing record of company, industry, and national standards activity, George H. Harnden is manager of the Engineering Materials and Processes Information Service of the General Electric Company, Schenectady. He is also chairman of the Administrative Committee on Standards of the American Society for Testing Materials, and chairman of the Miscellaneous Standards Board of the American Standards Association.

Mr Harnden started with GE as a test engineer in 1924. In 1930, he was made supervisor of the company's specifications and engineering materials information section, working on laboratory instructions for factory use, technical engineering reports, processing instructions, and purchase specifications.

In 1946, Mr Harnden established the Company Specifications Section in what was then the Standards Department, under one of the early national and international leaders in electrical standardization, the late L. F. Adams. In 1949, GE's Company Standards Division was organized under another electrical industry standards leader, Richard Sogge. Mr Harnden became head of the Company Standards Section of this Division.

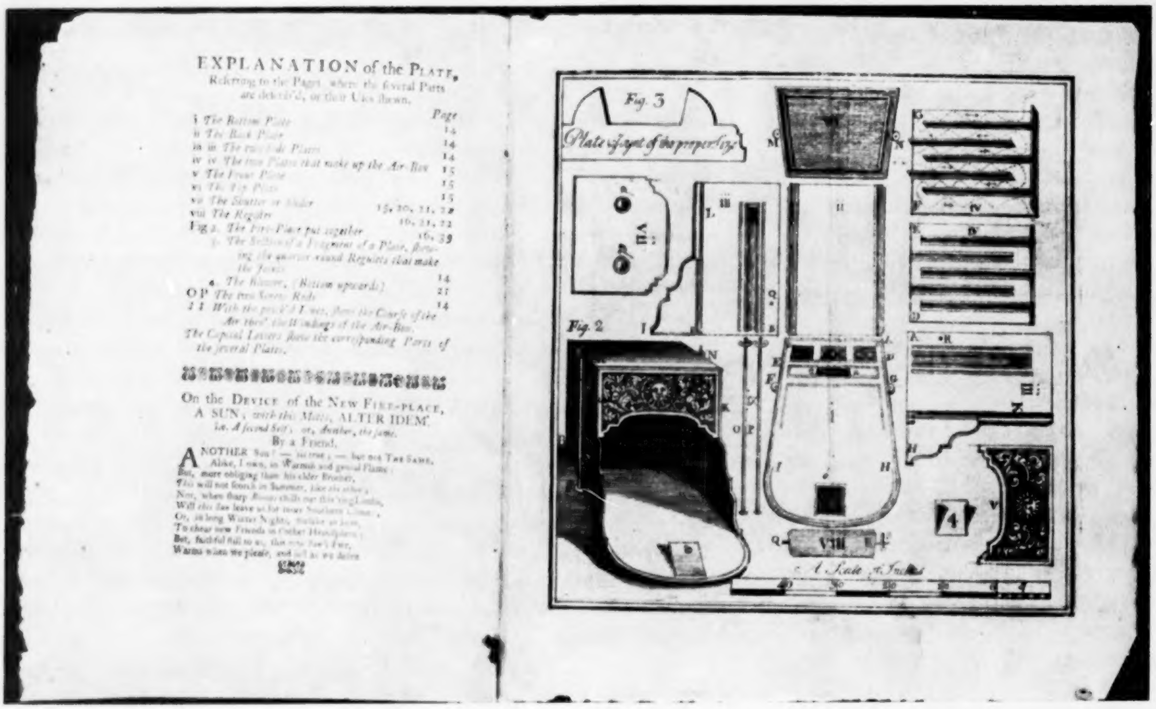
Again, GE's standards services were reorganized, in 1959, this time into two distinct groups—Industry Standards Service and Company Standards Service—as a part of the Engineering Administrative Consulting Service of Engineering Services. Mr Harnden became manager of Company Standards Services (now the Engineering Materials and Processes Information Service).

Mr Harnden has been a personal member of the American Society for Testing Materials since 1946. He has not only been an active member of many ASTM committees and subcommittees, but has also been a charter member and chairman of several. He has served on ASTM's Board of Directors, and is a member of a number of administrative committees. In 1952, ASTM presented its Award of Merit to Mr Harnden for notable services, especially in Committee B-5 on Copper and Copper Alloys, in other metals committees, and in the Administrative Committee on Standards.

Mr Harnden represents ASTM and the National Electrical Manufacturers Association on many ASA sectional committees, serves on the Materials and Testing Standards Board, and has been chairman of the Miscellaneous Standards Board since its organization in 1950.

Mr Harnden is married and has a son, a daughter, and one grandson. He is a charter member of the Schenectady Stamp Club and a member of the Masonic Stamp Club of New York. He is also a member of the Schenectady Genealogical Society. He has been active in local civil defense since 1941. In odd moments, he finds time for electronics and woodworking, motor boating, and fishing at his summer camp in the foothills of the Adirondack Mountains.

The *Challenge* of



The Historical Society of Pennsylvania

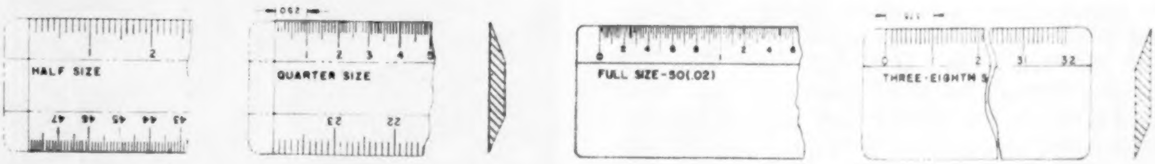
Benjamin Franklin used the decimal inch instead of the fractional inch in 1742, when he designed his famous Franklin stove. See the scale of inches in his drawing of the stove design above.

A NEW COMMITTEE whose work will be of concern to all U.S. industry, education, and science, held its first meeting in Detroit on February 3, 1961. The committee is ASA Sectional Committee B87, Use of the Decimalized Inch. It is charged with the responsibility of defining the decimal inch and presenting preferred systems for its use by all U.S. industry. (See page 126 for a report of the meeting.)

In view of the great significance of this committee's undertaking, Mr Belitsos' article describing the background of the problem is presented for the information of all concerned. It is published here by permission of the American Association for the Advancement of Science, which published the article originally in *Systems of Units,* 1959.

the Decimal Inch

by P. G. Belitos
Jet Engine Department, General Electric Company, Cincinnati, Ohio



IN THE STUDY OF HUMAN HISTORY it is fascinating to relate man's social and technological progress to his ability to measure linear distances with increasing accuracy. In early history, it was sufficient that various parts of the human body serve as measuring units since they were handy and required no unusual skill to use. For instance, one of the earliest standards of measurement was the cubit, which was the length of the forearm from the point of the elbow to the tip of the middle finger. Later the inch was the width of a man's thumb; the foot was the length of the reigning king's foot; and the yard was the distance from the thumb to the tip of the nose. During one period the standard for the inch even became the length of three pieces of barleycorn from the "middle of the ear."

In time, with the increase in commerce and communication, it became obvious that units of measurement could not be based on variables such as thumbs, elbows, noses, and corn. Imagine the problems created by the housewives who insisted on buying cloth only from tailors with long arms. As to the use of noses, there is no doubt that many of them were abused before the increase of trade led to more precise standards for measurement.

It is interesting to note that until the French Revolution, the official foot in France remained by royal decree as the "pied du roi" which was one-half of a cubit. England, on the other hand, clung to the so-called Saxon foot which at first measured about 13.20 inches. The yard, which was standardized in the early sixteenth century by Queen Elizabeth, was the basis for measurements of length for Thomas Newcomen, James Watt, and other famous engineers. Although this reference yard was later broken in two and joined together with an appreciable bend, it now differs from a true yard by 0.01 inch. It can be seen today in the Science Museum of London.

The French Revolution not only brought drastic social and political innovations, but also gave birth to the metric system. This introduced a comprehensive decimal system having as a basis the meter, which was taken as the one ten-millionth part of a meridional quadrant of the earth. Many years passed before the metric system was adopted as the obligatory system in France and other countries. Although its use was legalized in the English-speaking countries, they stand alone among the principal countries of the world in not adopting it.

Much has been written and will continue to be written for and against the universal use of the metric system in this country. However, there is little hope that it will ever be introduced into the English-speaking engineering world as the only legal system because of: (*a*) the prohibitive cost of a changeover due to the billions of dollars invested in existing capital equipment, tools, and gages, and (*b*) the confusion which would result in changing the basic unit of measurement which is the basis of millions of records, specifications, engineering data, etc. Although there has been some increased use of the metric system in science and technology, there is relatively little use of the system in American industry.

However, an important evolutionary change in process is gaining for the inch-using countries the most important advantage of the metric system. This evolutionary process involves the complete decimalization of the inch, based on the simple premise in common with the metric system that all higher and lower orders of the basic unit of measurement are formed on the basis of ten. Of great significance is the fact that it presents none of the difficulties that are involved in adopting the metric system. Let us examine the decimalization of the inch, its origin and the basis of its structure, its advantages and some of the obstacles that are impeding its complete adoption, its impact on education, its growth and use, and finally its future.

Decimalization of the Inch

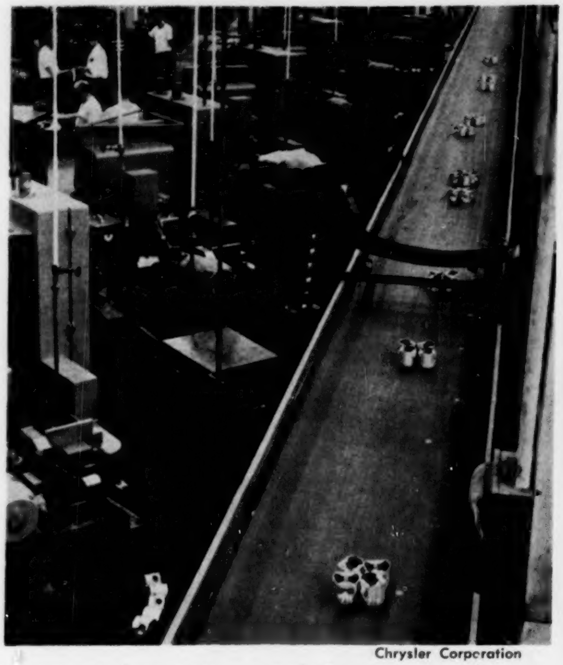
Since early United States history, the inch has been divided into common fractions, that is, the familiar sixty-fourth (1/64), thirty-second (1/32), sixteenth

(1/16), eighth (1/8), quarter (1/4), and half (1/2). These have been the basis of linear measurement in industry for generations and are still the basic units used in almost all educational curriculums from grammar school to the universities. Later, when precision-measuring devices were designed and built to meet the requirements of interchangeable manufacture, the old fractional units were no longer equal to the demands. Therefore, as in the metric system, the basic unit of measure was decimalized by multiples of ten.[1] As interchangeable manufacture spread and engineering design requirements became more and more precise, the decimal parts of an inch which were used became increasingly finer, progressing from thousandths to ten-thousandths, and then to hundred-thousandths, until today we are dealing with millionths and ten-millionths of an inch.

As the use of the decimals spread, the need for the continued use of fractions became increasingly questionable. Many creative innovators began to take steps which will eventually relegate the old fractional workhorse to the museums as a relic of the past. The late Carl Johanssen was one of the early innovators. In 1930 he was able to sell the late Henry Ford on the idea of adopting a decimal scale. It was Johanssen's idea to divide the inch into fifty parts, each representing two-hundredths (0.02) of an inch. This idea was not entirely new because even as far back as 1792, Benjamin Franklin used a decimal inch scale when he designed the now famous Franklin stove. This kind of forward-looking thinking was also taking place in other inch-using countries. It was just about a hundred years ago that Sir Joseph Whitworth, in presenting his Whitworth thread system, said:

> I have long been convinced that great and rapid progress would be made in many branches of the mechanical arts, if the decimal system of measure could be generally introduced. To state the case broadly, instead of engineers and machinists thinking in eighths, sixteenths, and thirty-seconds of an inch, it is desirable that they should think and speak in tenths, hundredths, and thousandths. I can assure those who have been accustomed to the fractional system that the change to the more perfect decimal one is easy of attainment, and, when once made, it will, from its usefulness and convenience, amply repay any trouble which may have attended its acquirement.

The Society of Automotive Engineers was the first engineering organization in our country to give unqualified support to this idea and its Aeronautical Drafting Committee was the first technical group to apply this idea in its recognition and use of the complete decimal system of dimensioning in 1946. Through its influence, together with other forward-looking technical, industrial, and company groups, the use of this system began slowly to spread throughout the United States. The decimal system achieved national status for the first time in September 1957, when the new American Standard on Dimensioning, Y14.5-1957,



Chrysler Corporation

"In numerical positioning control of automatic machine systems, linear motions are expressed in inches and decimal parts of an inch."—Belitsos. This conveyor belt transferring pistons from milling operation to plating tank, is part of a completely automatic piston line operation.

recognized it as a national practice. Although the practice of using fractions has not yet been eliminated in the national standard, it has been relegated to a less prominent position.

It is now evident that the process of evolution is inexorably progressing in the direction of the complete decimalization of the inch. A good example of this process in action is the latest edition of the combined SAE Aeronautical and Automotive Engineering Drawing Standard on Dimensioning,[2] which will be published in early summer 1961. With the exception of one minor paragraph which merely acknowledges the existence of the fractional inch, the entire standard, which is the most advanced of its kind in the English-speaking world, has been completely decimalized. This is ample evidence that the fractional inch system is losing ground rapidly, particularly in the vast mechanical producing industries.

Basis of Decimal Inch System

The basic increment of the decimal inch system which is being widely adopted throughout this country in the dimensioning of engineering drawings is a fiftieth of an inch expressed as a two-place decimal (0.02). It can be readily seen that this unit is just a few thousandths of an inch larger than the basic fractional unit, the one sixty-fourth of an inch (1/64 = 0.0156), and, therefore, an easier unit to use for most engineering design work. For comparative purposes,

[1] In the other direction, it is conceivable that terms could be coined to represent 10 inches, 100 inches, and other multiples of 10 inches which can replace the foot, the yard, and the mile.

[2] This is being published as a section of the new SAE Aero-Auto Drafting Manual.

it corresponds very closely to one-half of a millimeter in the metric system (1mm = 0.0394 in.).

Engineering dimensional requirements are expressed in even increments of 0.02 (for example, 0.04, 0.06, 0.08, 0.90, 1.06, 2.00), which take care of the majority of linear dimensions. Where required, design requirements may be expressed in three, four, five, or more decimal places (for example, 0.002, 0.0005, 0.00008). Angular requirements in this system are most logically expressed in angles and decimal parts of angles (for example, 18.50 deg., 93.10 deg., 105.25 deg.). The expression of parts of angles in decimals is used only to a limited extent at present, although this practice is beginning to get wider recognition since it has a logical place in the complete decimal system. Its use will, no doubt, gain additional impetus with the increase in usage of automatic handling of numerical data. For instance, the increased use of rotary tables and machines containing built-in rotary tables that are controlled by means of perforated tape is one of the developments that are accelerating the use of decimalized angles.

Advantages of Decimal Inch System

The use of decimals has many advantages over the use of fractions. Some are generally well known; others have only recently come into prominence. The following is a composite presentation of these advantages with a brief analysis of each.

1. *Simplifies arithmetic computations and greatly reduces the time and effort to make them.* For example, it has been demonstrated that it takes as much as five times longer to add a series of fractions than it does to add a series of decimals. The relative simplicity of adding a series of two-place decimals is shown below. On the other hand, note that the fractions, if converted into the equivalent decimals, vary from one- to six-place decimals and, after adding these, the result still has to be converted back to a fraction.

Two-Place Decimal System	*Fractional System*	*Decimal Equivalents*
0.02	1/64	0.015625
0.04	1/32	0.03125
0.12	1/8	0.125
0.32	21/64	0.328125
0.06	1/16	0.0625
0.26	1/4	0.25
0.96	31/32	0.96875
0.50	1/2	0.5
2.28	29/32	2.281250

2. *Eliminates any need for conversion of fractions to decimals (or vice versa) with its resultant problems.* For example, in converting fractions the question arises as to the number of decimal places that apply; that is, should the 21/64 in the example shown above be 0.328125, 0.32813, 0.3281, 0.328 or 0.33? This also applies in converting the readings of measuring tools such as micrometers, calipers, or height gages from decimals to fractions. The need for constant reference to conversion charts is eliminated and the possibility of making errors is reduced.

3. *Facilitates the use of scales for layout and measurement by engineering, manufacturing, and inspection.* Since the distance between any two adjacent graduations on the common decimal scale (with 0.02 graduation) is close to 30 percent greater than any two graduations on a fractional scale (with 1/64 graduations), it results in easier reading with less chance for eye strain and error.

4. *Reduces the division of the inch to a single dynamic and logical basis which is compatible with the requirements of modern industry and science.* On a decimal basis the inch can be divided very simply to any degree of precision; this, of course, is not practicable with fractions. This single basis simplifies the work of engineering, manufacturing, and inspection. To cite one important application in engineering, there is no longer any need to mix fractional and decimal parts of an inch in the dimensioning of engineering drawings or in any related arithmetic computations.

5. *Provides a system which is easier to learn and understand.* In this respect it has the same advantage as the metric system. It is very simple to deal with higher and lower orders of 10. For instance, dividing the inch into 10 parts results in units of one hundred thousandths (0.100) dividing these units into 10 parts results in units of ten thousandths (0.010), etc. It has the added advantage of being closely related to the common everyday practice of expressing American monetary values in units and decimal parts of units (dollars and cents), such as, $4.50, $2.96, $0.84, and $0.02.

6. *Provides a single unit of linear measurement which can be most easily and directly converted to millimeters.* In this country, the American Standard B48.1-1933 establishes the practice for inch-millimeter conversion for industrial use with the basic relationship of 1 inch equal to 2.54 millimeters. The conversion of decimal parts of an inch to millimeters (or vice versa) is a simple operation. The use of decimals, therefore, eliminates the need to take the added steps involved when fractions are used. To that extent, it simplifies any standardization efforts between the inch-using countries and the millimeter-using countries.

7. *Finally, the complete decimalization of the inch is compatible with automation.* On the basis of this one consideration alone the use of fractions will become obsolete, since they cannot be easily and directly used in data processing and numerically controlled equipment. By their very nature, the cards and tape used to store numerical data can best record these data in decimal form. For example, in numerical positioning control of automatic machine systems, linear motions are expressed in inches and decimal parts of an inch. Rotary motions can be expressed in degrees

and decimal parts of a degree, or it may even be desirable to divide rotary motions into equal decimal increments of a revolution, such as 1000 parts.

Obstacles to Growth of Decimalization

In the last decade, the decimalized inch has been adopted on a widespread basis throughout this country. For example, it is estimated that close to 75 percent of the industries that are producing mechanically are now using it. With all the advantages that it has to offer, one might ask why it has not yet been universally adopted in this country, and for that matter by all of the inch-using countries. There are several reasons for this.

First is the deeply entrenched "fractional tradition." It is true that one of the most difficult obstacles in the path of progress is the resistance of the human mind to change, even in the face of logic. Most of us have been raised from grammar school to think in terms of fractions. In fact, those of us with children are still struggling with them as they cut their teeth on fractions in the early grades. Think of all the arithmetic textbooks that will become outmoded with the change to the complete decimal system, and think of how much easier it will be for us to help our children with their arithmetic.

To overcome this fractional tradition with which even our engineers have been indoctrinated, some of the leading universities are beginning to orient their engineering students to the complete decimal system. Purdue University has been the first large engineering school in the country to graduate a class of mechanical and aeronautical engineers in 1960 who have been trained in their basic engineering drawing courses to work entirely in terms of decimal parts of an inch. Reports indicate that, although there was some doubt in 1956 when the decimal system was first introduced at Purdue, the engineering graphics staff is now convinced that a better job is being done in training students than ever before. Other universities are taking steps in this direction, and it can be taken for granted that the use of the decimal system at these universities will quite naturally be picked up by the high schools. It is conceivable that in time this will filter down to the grade schools, and we will one day have a generation of engineers who will think and design entirely in terms of decimals.

It is interesting to see this fractional tradition in action in industry. When the pioneering companies first introduced the use of all decimals on their engineering drawings, the first reaction of most manufacturing and inspection people as well as the many suppliers was that the parts would be more expensive to produce. After all, for generations decimals were reserved for micrometer values, and it was an unusually precise part whose dimensions had to be expressed entirely in decimals. It seemed a most difficult task to convince those who were bound by this fractional tradition that a tolerance of 0.02 was more liberal than 1/64 inch. In fact, this tradition is so deeply rooted in some people that they just cannot learn to think entirely in decimals.

Next is the resistance in some segments of industry, such as the small tool manufacturers, who continue to use fractional sizes. This is an even more difficult obstacle than the first, because it includes the fractional tradition combined with fractional hardware. In the case of sizes of material, we get involved with "gage" designations as well as fractions. In this situation, many companies have chosen a modified version of the complete decimal system which uses decimals in all cases except for expressing (*a*) stock material sizes, (*b*) standard thread sizes, (*c*) sizes based on manual tools which have common fractional, alphabetical, or numerical "names," and (*d*) dimensions of angular measurement.

Let us go back again to the pioneering companies that are using the complete decimal system in the dimensioning of their products on engineering drawings. They use decimals for expressing all engineering requirements, including the size of geometric shapes produced by commercial tools and cutters that are at present being furnished in fractional sizes. This has caused some difficulties with their suppliers and vendors. However, their continued use of the complete decimal system, for which they deserve much credit, is providing the needed attack on the "fractional" barrier which will eventually result in a major breakthrough in these segments of industry.

A third obstacle, which has been overcome in recent years, was the need for a recognized standard for decimal inch scales. With the growing use of the decimal inch, this standardization became necessary to arrest the useless individuality in the specification of decimal scale design and calibration, a practice which was costly and inconvenient to both producers and users of scales. There was also a need for decimal shrink scales which could be used to accommodate shrinkage in casting and forging work. The handling of this problem is a classic example of how progress can take giant steps when appropriate collective action is taken—progress which benefits producers and users alike. After the need had been determined, an American Standard (Z75.1-1955) was developed in record time during 1955 and gained immediate and widespread recognition and use. Now, there are a countless number of decimal scales made to this standard, which can be found in almost every engineering office and manufacturing shop in the country. They are even making their appearance in the engineering classes of several universities.

Meeting the Challenge of the Decimal Inch

Although obstacles such as these have slowed the progress of the complete decimalization of the inch, they will eventually be eliminated. It is apparent that even this relatively simple transition to the complete decimalization of the inch presents many educational

Hubert H. Crawford

"Wait, that '.5' dimensions should've been '.05'!"

and other problems. On this basis, we can appreciate the magnitude of the problems that would arise if the inch-using countries were ever to adopt the metric system, which introduces the complication of a completely new basic unit of measurement.

The adoption of the complete decimal inch system by the inch-using countries therefore offers a challenge which must be met as the only logical alternative to the adoption of the metric system. Many steps can be taken to meet this challenge.

1. *Increased recognition in industry, national, and international standards.* A major step has already been taken in American industry and national drafting standards (SAE and ASA). Further important steps can be taken by obtaining recognition for the system in any future unification programs which will be taken by the inch-using countries. This can be a part of the activities that will take place in the follow-up of the last ABC (American-British-Canadian) unification conference held in Canada in October of 1957.

2. *Increased recognition by technical societies and scientific associations.* The representatives of the many companies using the decimal system that are participating in various technical and scientific activities (AAAS, SES, ASME, SAE, ASTME, ASEE,[3] etc.) can encourage the examination and recognition of this system in their local and national meetings. Standards engineering representatives can sponsor standards committee recognition of the system in the area of screw threads, various types of tools, materials, etc. Most important, of course, would be the national standards activities of the American Standards Association, which extends also into the areas of international standardization.

An interesting illustration of this is the work being done in the metal and metal-working industries which have been plagued by the obsolete system for designating material thicknesses (and diameters) by gage numbers. The multiplicity of the different gage systems used throughout industry and their variations in basic sizes is fantastic and most confusing. The widespread use of the complete decimal system is accelerating the solution of this problem by promoting the use of the preferred decimal thicknesses for metals established by the American Standard B32.1-1952, which in turn makes it economically feasible for warehouses to stock these sizes. The following advantages illustrate the beneficial effects of this type of integrated standardization activity.

(*a*) All materials can be stocked in the same decimal thickness. Besides the convenience of a single series of decimal sizes, this permits the substitution of one material for another, where applicable, without changing dimensions.

(*b*) Decimal sizes are immediately recognizable without reference to various gage tables.

(*c*) There is no possibility of getting the wrong sizes because of confusion among different gage systems.

This type of integrated standardization will be the practical means by which the obstacles to the adoption of decimals by certain segments of industry will eventually be overcome.

3. *Increased recognition by educational institutions.* The universities that have made a start in this direction should be encouraged by the example of industry to continue and extend their programs. The fact that a number of university professors have an opportunity to participate in many of the cooperative engineering programs of technical societies or to have summer employment in industry gives them an opportunity to get a more realistic and practical understanding of the background for the latest trends in industry.

4. *Increased recognition in engineering textbooks.* A great deal of progress will be made when some of the forward-looking engineering textbooks (particularly in the field of graphics) begin to recognize the complete decimalization of the inch. This will make the new concept available to increasing thousands of students who in turn will spread it in ever widening circles of contact.

Conclusion

We have demonstrated that the complete decimalization of the inch saves time, reduces cost, prevents errors, simplifies education, and is compatible with the requirements of mechanization and automation. It represents a natural and logical step in our progress and one which can be made with relative ease. We are well down the road to its complete acceptance. With a concerted effort on the part of standardizing agencies and educational institutions, its adoption by the inch-using countries can be accomplished in the next few years. This will elevate us to another plateau of progress from which further important steps can be taken towards worldwide unification of the decimalized inch and the decimalized millimeter.

[3] American Association for the Advancement of Science, Standards Engineers Society, American Society of Mechanical Engineers, Society of Automotive Engineers, American Society of Tool and Manufacturing Engineers, American Society for Engineering Education.

Standardization in France

The offices of AFNOR are in this building at 23 rue Notre-Dame des Victoires, Paris.

By J. Birlé
Director General of AFNOR

The years 1918 and 1926 are two outstanding dates in the history of standardization in France. In June 1918, the supreme effort being made in the field of armaments, combined with the work that had to be done to rebuild the ruins devastated during the first world war, led governmental and industrial authorities to create a "Standing Standardization Commission." This commission was known as CPS. Eight years later, when national standards bodies of the several countries decided to create the International Standards Association, the Association Française de Normalisation (AFNOR), a national body, was founded to coordinate and unify standards work already undertaken in France separately in certain industrial fields—electrical, mechanical engineering, and automobiles.

In reality, French activity had been impregnated with the idea of standardization long before this. Indeed, as early as the middle of the eighteenth century, standardization appears in the principle of interchangeability of mechanical parts in Valières' and Gribeauval's conceptions of artillery ordnance. Some tens of years later, under cover of the upheavals caused by the French Revolution, came abolition of the whole body of ancient French weights and measures—traditional but incoherent. These were literally swept away by the epoch-making standardization represented by the decimal metric system of units dedicated by France "to all times and all peoples." In the nineteenth century, this same idea influenced the Frenchman Charles Renard to apply the properties of geometric sequences and to make use, for airship ropes and rigging, of the series of numbers ("preferred numbers") worked out by him. Under the impetus given by M. Albert Caquot[1] to their use in aeronautical manufacturing during World War I, these series of numbers became generally used in industrial production and were quickly adopted by standardizers in all parts of the world. They were also adopted by the ISA and then by its successor, the International Organization for Standardization (ISO) for the classification of numerical sequences of all kinds of characteristics and properties.[2]

Finally, it was the same idea which inspired the first international unification of screw threads. This was adopted in Zurich in 1898, on France's recommendation, in the International System (S. I.). Since that time, this system has dominated mechanical engineering in Europe, and with a few slight adjustments still remains the basis of the present ISO metric thread standards (R68, Screw Threads, 1958).

Although it may not be possible to achieve it in all cases, the ideal of standardization, whether it be of methods, processes, or products, must be to adopt sound conceptions based on a fair balance between requirements to be met and existing facilities for im-

[1] M. Caquot, famous for the invention of the "Caquot Sausage" (oblong observation balloon which baffled the German air force in World War I), was appointed a member of the administrative council of AFNOR when it was formed in 1926 and has taken an active part in its work ever since. He succeeded Howard Coonley (USA) as president of the International Organization for Standardization, serving from 1950-1952. In 1952, he was awarded the Grand Croix de la Legion d'Honneur.

[2] ISO R 3, Preferred Numbers—Series of Preferred Numbers (1954): ISO R 17, Guide to the Use of Preferred Numbers (1956). Both these recommendations have been embodied in American Standard Z17.1-1958, Preferred Numbers.

LEFT TO RIGHT: M. Tribot-Laspierre, treasurer of AFNOR; l'Ingenieur General Pierre Salmon, Commissioner of Standardization; A. Caquot, president of AFNOR; J. Birle, director general of AFNOR.

plementation and production. Economy and logic, stabilization (but not immobility), must be harmoniously combined in drawing up the standard, so that it represents the best that can be achieved in connection with all aspects of the subject it covers. It must follow common guiding principles which are recognized in all fields, so that the result will be a harmonious and coherent whole. It must be effected within a neutral framework, uninfluenced by any special interests, where all technical opinions are given free play in the endeavor to use all means that offer the best chance of success in providing rules that can be followed by everyone, and that form a solid foundation for a sound economy well suited to the requirements.

It must not be imagined, however, that it is always easy to fulfill these conditions and, even if they are fulfilled, to maintain them. For, indeed, it may well be that at times their fulfillment is hampered by considerations of a physical order, an existing state of facts, or periods of conversion or adaptation. Yet these conditions must always be kept in mind, and any reasons which might seem to make it necessary to ignore them must be carefully weighed.

Moreover, practical implementation of these principles necessarily calls for a certain spirit of sacrifice. For an industrialist to agree to standardization and to proceed to immediate conversions involving costly changes for the sake of general advantages in the more or less distant future is not always easy. This is especially true if those concerned have lost sight of the fact that standardization is not merely a source of strength in the immediate future but is what financiers call a long-term investment. Since technical facilities undergo constant evolution—and even very rapid evolution nowadays—it may well be feared that specifications which merely constitute catalogs will very soon be disregarded and out of date. If, on the contrary, standardization is directly based on the functions to be performed by the article covered, then a more durable structure will be built with a view to attaining the ultimate objective of standardization—to specify the service characteristics of the article in question. When all is said and done, standardization of functions [performance requirements] is the essential purpose and offers much more stable results than standardization of the means of achieving them.

Let us now take up the practical means which we consider should be adopted to carry out our work of standardization in accordance with these concepts. This is what we have tried to achieve in France, although we cannot claim to have succeeded as completely as we would have liked.

Standardization in France is prepared, directed, and achieved, under the authority of the Government, by an association which, though private, enjoys official status in its work—the Association Française de Normalisation (AFNOR).

Government authority is excercised by the Commissaire à la Normalisation, Ingénieur-Général P. Salmon.[3] His role, that of a high ministerial official, is essentially one concerned with directives, arbitration, and program. The president and chairman of the Board of Directors of AFNOR is M. Albert Caquot, member of the French Institute and former president of ISO.

Under M. Caquot's authority, AFNOR centralizes and coordinates all standardization work. It is assisted in its work by the standards departments of the various industries which draw up the draft standards in their own particular sector, and it appoints AFNOR standardization commissions which complete the work and make sure of its acceptance.

To this end, AFNOR circulates the draft standards thus drawn up for a very wide public inquiry. After taking into account all the comments which it believes to be acceptable, AFNOR submits the amended drafts with a detailed report for ministerial ratification through the Commissaire à la Normalisation.

The latter then also submits the standard to an inquiry, which is restricted, however, to ministerial departments. He then seeks ministerial ratification of the draft as a French Standard. Once this ratification has been given, these departments are obligated to apply the standard in all government contracts.

Ratification does not necessarily make the standards mandatory in private transactions, however.

In the international field, the Commissariat à la Normalisation and the Association Française de Normalisation jointly represent French standardization. In the

[3] General Salmon was recently elected president of the Societé des Ingénieurs Civils de France.

ISO, their role consists in seeing how French Standards may be put into conformity with ISO Recommendations. Within the Communauté Européenne which studies, in a more restricted field, the setting up of "EURONORM" in the iron and steel industry, they see that as far as possible these documents be drawn up in harmony with ISO Recommendations on the same items.

In addition, AFNOR represents France at international meetings with the standardization agencies of other countries, and is thus the French member committee of ISO. It is AFNOR which determines the positions proposed and defended by France at these meetings. It also centralizes documentation on foreign standards.

Aluminum cooking and baking utensils

Fruits and vegetables

The various stages of the procedure for producing standards, of which AFNOR is in charge, are as follows:

1. Entry of the proposed standard in the program of work, and drawing up of a basic draft. This latter is done by a qualified "rapporteur" or agency (usually the producer—in particular, the standardization departments of the trade in question).
2. Consideration of the proposal and discussion by an AFNOR commission (organized to operate within an independent framework) representing all the parties concerned—producers, users, distributors, public authorities, scientific bodies and prominent individuals, laboratories, and others. Completion of a draft standard.
3. Public inquiry by AFNOR, as extensive as possible. This often extends even to foreign countries. This is done with a view to obtaining the maximum number of opinions. The replies are compiled by the same commission and the final document is drafted.
4. Transmittal by AFNOR to the Commissariat for approval by the government departments, as stated above.
5. Printing, circulation, and publicity to promote use of the standard.

AFNOR'S PERSONNEL consists of slightly more than 200 people, of whom some 50 are engineers and technicians. To them must be added a substantially equal number of people in some 30 standardization departments and offices of the various industries or trades, who collaborate in the work.

The role of these offices is mainly to prepare preliminary drafts. Owing to the fact that they belong to groups of producers and also large and well organized users, as well as certain government procurement services or nationalized industries, such as the railways, electricity, gas, and others, they are particularly qualified to work out these basic documents.

Oil burners

Installation of electrical appliances. Wire and cable

Moreover, it is estimated that some 700 or 800 experts, members of commissions, voluntarily take part in some thousand working sessions which AFNOR organizes year in, year out.

Finally, AFNOR can count on approximately 10,000 correspondents on whom it calls throughout the country, and sometimes even in foreign countries, for their opinion on the draft standards. Each draft standard is circulated for four months, in the course of some 60 public inquiries which AFNOR must carry on each year before the drafts can be converted into standards.

On the national level, the results achieved are given concrete form in 4,800 French documents, or about 12,000 pages of technical specifications. These are adopted at the rate of 200 standards per annum, half of which cover new subjects, the remainder being revisions of existing standards to bring them up to date.

As far as ISO is concerned, the considerable extent of France's international participation is exemplified by its active collaboration with 250 ISO technical committees, subcommittees, and working groups. French representatives attend, on an average, 200 meetings of these groups per annum.

While on the subject of international documentation, it may be mentioned that AFNOR's library includes from 40,000 to 50,000 foreign standards from 20 countries. They are open to inspection by the public and are invaluable in connection with studies concerning standards on the national level, which can thus profit from the experience of other countries.

DEALING NOW WITH THE USE of standards, we must first draw particular attention to the existence in France of a national mark of conformity with French Standards. This is known as the "NF Mark."[4]

The purpose of this national mark is to give the buyer or user assurance, in general, that the product bearing the mark really complies with the conditions laid down in the standard—more particularly, with conditions which make it "fit for the job."

The mark was created by a decree-law of November 12, 1938, followed by another of May 24, 1941 (on standardization in general) and an interministerial order of April 15, 1942. This latter conferred its present status on the NF Mark.

[4] Examples of some of the most widely used NF Marks are spotted throughout this article.

The NF Mark is an official mark under two heads: (1) it has its own legal status; (2) it is based on the ratified French Standards, which are official documents.

In order to ensure that products bearing the mark are in conformity with the standard, it is necessary to carry out what is known in France as a "control," or check. This check begins with an investigation of the maker's own manufacturing and inspection facilities, continues by means of laboratory tests and inspection of the prototype in the case of a new series or of an apparatus or appliance taken as a sample during manufacture, and is subsequently maintained by inspection and tests of apparatus or appliances selected at random at all stages of distribution.

Management of the mark is in AFNOR's hands. AFNOR organizes its application and control with the direct cooperation of producers, distributors, and users through committees which will be mentioned later.

It is to be noted that, as in the case of standards, the NF Mark is not obligatory, although there is nothing to prevent its being made mandatory should this be found necessary.

Finally, it is recognized that the NF Mark must be financed by dues paid by holders of a license to use it.

Furniture

Household electric appliances

To ensure practical implementation of all these principles, AFNOR includes the following agencies:
(1) A Conseil de la Marque (Council on the Mark), whose aim is to bring together the body of producers, consumers, and public authorities appointed by the Commissaire à la Normalisation, on AFNOR's recommendation, to help distribute the mark and make it better known.
(2) A Management Committee consisting of 12 members selected from among the Council members. This committee sets the policy, passes upon the proposals for allocation of the mark submitted to it by the special committees, passes on disputes, and decides upon penalties.
(3) Special committees, one per branch of industry, composed of representatives of producers, users, inspection and control laboratories, and scientific bodies. The principal tasks of these committees are to lay down rules governing allocation of the mark, to appoint the laboratories to carry out tests and checks, to make proposals for the granting of licenses to use the mark, and, in case of noncompliance with the rules, to inflict penalties—in a word, to manage the mark, each in its own sector.

What are the results so far achieved?

Launched in 1945, the first results of creation of the NF Mark were to become associated with marks concerning gas apparatus, cements (City of Paris), and coal-fired heating and cooking appliances. It thus had the benefit, at its very beginning, of ground which had been well prepared by industrial groups which were only too anxious to join up with national standardization.

Subsequently, requests were made to extend the use of the mark to other fields of activity where there were as yet no guarantees, and also in fields where the long-standing electrotechnical mark (Union des Syndicats de l'Electricité—USE) was used. Finally, still other sectors which had no warranty marks of their own applied for it.

At the present time, the NF Mark is regularly applied in some 20 branches, listed below:

Appliances using combustible gases
Gas pipes and tubes
Electrical household appliances
Equipment for electrical installations
Electrical wires and cables
Coal-fired heating and cooking appliances
Cast aluminum cooking and pork butcher's appliances
Refrigerating appliances
Pressure cookers
Laboratory apparatus (paint consistometry)
Kraft paper
Lime and cements
Building hardware
Furniture (furniture of solid and veneer woods and wooden office furniture)
School exercise books
Fuel oil burners and stoves
Fruit and vegetables
Letter boxes
Manufactured concrete articles
Protective helmets for motor cyclists

To give an idea of the volume of products to which the mark is applied, we point out that the total value of the products subjected to the checks for the NF Mark in one year exceeds 2½ milliard new francs, or about 500 million dollars.

In conclusion, we have endeavored to give in this article in a few pages a general view of standardization in France. We have been forced to omit many points in order to retain only what has appeared to us to be essential. We shall be only too glad if we have succeeded in interesting the reader in work which is being carried on with enthusiasm by a family of voluntary or professional standardizers who become more convinced each day of the necessity for their endeavors.

Lime and cement

Building hardware

SPRING MEETING—1961

COMPANY MEMBER CONFERENCE

of the

American Standards Association

Pick-Congress Hotel
Chicago, Illinois

June 1 and 2, 1961

PROGRAM

THURSDAY, JUNE 1

8:15 a.m. REGISTRATION

9:00 a.m. **Presiding:** *B. Scott Liston,* Chairman, Company Member Conference; Standards Administrator, Diamond Alkali Company, Cleveland, Ohio

WELCOME

John Ward, Purchasing Agent for the City of Chicago

KNOW YOUR CMC

Cyril Ainsworth, Deputy Managing Director, American Standards Association, New York, N.Y.

COMPRESSED GAS CYLINDER CONNECTIONS AND THE GRACE OF GOD

Allen L. Cobb, Director, Industrial Safety, Eastman Kodak Company, Rochester, N.Y.

10:45 a.m. **Chairman:** *Ray J. Abele,* Standards Engineer, Burroughs Corporation, Detroit, Michigan

UNDERWRITERS' LABORATORIES, INC SAFETY STANDARDS IN ACTION

1. **Testing**–*D.L.Breting,* Superintendent of Label Service, Underwriters' Laboratories, Chicago, Ill.
2. **Design**–*C. A. Mattingly,* Staff Specialist, Warwick Manufacturing Corporation, Chicago, Ill.
3. **Enforcement**–*W. P. Hogan, Jr,* Chief, Electrical Inspection Bureau, Chicago, Illinois

12:30 p.m. LUNCH

2:00 p.m. **Chairman:** *Clifford W. Straitor,* Standards Engineer, The Detroit Edison Company, Detroit, Michigan

WORKSHOP ON "EVALUATION OF A STANDARDS PROGRAM"

Introduction of the subject by *George F. Habach,* Vice President, Administration, Worthington Corporation, Harrison, N.J.

(There will be ample opportunity for audience participation in this workshop.)

Workshop (continued)

3:45 p.m. **Chairman:** *Bernard W. Bace,* Head Engineer, Standards Section, American Oil Company, Whiting, Indiana

STANDARDS FOR COMMUNICATION

Joe W. Coffman, President, Tecnifax Corporation, Holyoke, Massachusetts

FRIDAY, JUNE 2

9:00 a.m. **Chairman:** *William H. Old,* Director of Purchasing, The Babcock and Wilcox Company, New York, N.Y.

OUR CHANGING INDUSTRY

Charles M. Wright, Executive Director, Helical Washer Institute, Union Lake, Michigan

PROGRAMMING AUTOMATED DESIGN

H. B. Wortman, Advisory Engineer, Systems Planning Group, Westinghouse Electric Corporation, East Pittsburgh, Pennsylvania

11:00 a.m. **Chairman:** *Robert F. Franciose,* Standards Division, General Electric Company, Schenectady, N.Y.

PROBLEMS CONFRONTING THE MILITARY AND INDUSTRY CONCERNING PROPRIETARY RIGHTS

Lt. Col. H. T. Dykman, USAF, Headquarters, Air Material Command, Wright Patterson Air Force Base, Dayton, Ohio

12:15 p.m. LUNCH

1:30 p.m. FIELD TRIPS

1. Manufacturing Research Plant–International Harvester Company
2. Underwriters' Laboratories, Inc

Registration fee $4.00–Luncheon, each day $3.50.

For further information, write H. G. Lamb, American Standards Association, 10 East 40 Street, New York 16, N.Y.

WHY ELEVATORS ARE SAFE

by George H. Reppert
Code Engineer
National Elevator Manufacturing Industry, Inc

Everyone uses elevators—and everyone shudders when an elevator accident is reported. On the other hand, oddly enough, it is generally taken for granted that an elevator will carry its passengers day after day, year in and year out, without injuring a passenger.

This confidence is well justified. The accident records indicate that elevators are the safest mode of public transportation in the United States. The latest statistics show that there are approximately 255 thousand passenger elevators in operation in this country and that they transport nearly 41 billion passengers per year over a distance exceeding 138 million miles with passenger miles numbering 556 million. The accident records published by the Otis Elevator Company for the period January 1, 1950 thru December 31, 1955 indicate that the accident rate per 1000 elevators in service was 8 for manually controlled elevators and 5.3 for automatically controlled elevators.

The American Standard Safety Code for Elevators, Dumbwaiters, and Escalators, now available in a 1960 edition, and its companion, American Standard Inspection of Elevators (Inspectors' Manual), have had an important role in this unusual safety record.

The first edition of the American Standard safety code was published in 1925, sponsored by the National Bureau of Standards, American Institute of Architects, and the American Society of Mechanical Engineers. It has now been brought into line with new developments as of 1960.

The Inspectors' Manual was first published in 1937 and has now been brought up to date with the 1960 edition of the standard.

Both have been widely used for many years by state and local authorities, and the standard is followed closely by manufacturers in designing and installing elevators.

Although crude forms of elevators were used even by ancient peoples, their widespread use had to wait for the development of an automatic car safety device to prevent the car from falling should the lifting cables break. In 1853, Elisha Graves Otis perfected the first elevator car safety device, which he demonstrated by riding on the elevator car and having the suspension rope cut. This demonstration was given at the Crystal Palace Exposition in New York in May, 1854. It opened the way for the design and installation

Otis Elevator Co.

of safe elevators and made possible the development of today's multi-storied buildings.[1]

The early elevators, both passenger and freight, were driven by belts from a line shafting or by steam engines which caused a drum to revolve to which the car suspension ropes were attached and which were wound and unwound in grooves on the drum as the car moved up and down in the hoistway. In 1878, the rope-geared hydraulic elevator was developed. It gradually replaced the belt- and steam-driven type.[1] In 1889, the first successful electric drum-type elevators were installed in New York City and in 1902 the first successful direct plunger-hydraulic elevators were installed. This type of elevator could be installed for high speeds in high buildings.

The major technical development which eliminated all height restrictions for buildings was the development in 1903 of the traction-type elevator machine. This design eliminated the winding drum and replaced it with a traction sheave around which the car suspension ropes passed but were not attached to the sheave. With this type of machine, the motion of the car is obtained through friction between the suspension means and the traction sheave. The traction machine is either of the geared type, used usually for car speeds of 300 feet per minute or lower, and of the gearless type with the traction sheave mounted directly on the driving motor shaft, used for higher car speeds. The development of the traction-type machine removed the restriction on the height of buildings. By 1910 this type of elevator machine was in general use and has now practically eliminated the use of the drum-type machine.

1 *The First One Hundred Years*, Otis Elevator Co., 1953.

Hoistway door interlocks, which prevented the elevator from leaving a landing until the hoistway door was not only closed but also locked, and car gate contacts, which required the car gate to be closed before the car could start, had been used on single automatic push-button elevators installed in private residences as early as 1900. There were, however, no standards for the design of these devices until 1921, when a standard developed by a committee set up by the American Society of Mechanical Engineers was published. While the design requirements were further expanded in the first edition of the American Standard in 1925, no requirement for laboratory tests and for approvals were incorporated in the standard until the 1931 edition. This action followed a study made by the National Bureau of Standards which indicated that such tests were necessary in order to ensure continuous safe operation.

The 1921 edition of the ASME code included a few requirements for the design of car and counterweight oil buffers and required their use for car speeds above 250 feet per minute. Some additional design requirements were included in the 1925 edition of the American Standard, including a requirement for a test in the field with rated load in the car. It was not until the 1931 edition was published, however, that approval by the enforcing authority based on specified laboratory endurance tests was included. These test requirements were based on a series of tests made at the National Bureau of Standards under a research program financed by the ASA sectional committee.

After the development of the traction-type elevator in 1903, the next development was the automatic self-leveling elevator in 1915[1] and the application to elevators of generator field control (Ward Leonard). This was soon followed by the development of power operating devices for hoistway and car landing doors, and in 1924 by the high-speed signal-control elevator, the starting of which was controlled by an operator in the car but which would stop automatically at any floor on the actuation of a floor stop button at that landing by a waiting passenger. With this type of control, the car would make all stops for passengers desiring to travel to higher floors only when the car was traveling in the up direction and for all passengers desiring to travel to lower floors only when the car was traveling in the down direction. In addition, the operator in the car could set up stops for the car passengers by actuating floor buttons in the car operating panel. This type of elevator soon became the standard for the higher-rise office buildings, department stores, and other public buildings.

For small office buildings, hospitals, and similar buildings of limited rise, an automatic push-button elevator was developed which would stop automatically in each direction of travel to pick up passengers who had actuated landing stop buttons for that direction and would also stop automatically in response to the actuation of floor buttons in the car operating panel. This was known as collective automatic control. This type of elevator could be installed in groups of 2 or 3 and would operate the cars entirely automatically without an operator.

The next and most recent development has been that of a type of fully automatic operation for application to a bank of high-speed elevators of any number. The operation of the cars is coordinated by a supervisory control system, including a means of automatic dispatching by which selected cars at designated dispatching points automatically close their doors and proceed on their trips in a regulated manner, making all car and landing stops automatically in response to calls set up by the operation of a car or landing button by the passengers. With this type of operation, no operator is required in the car. Protective devices to cause closing doors to re-open automatically and prevent injury to passengers entering or leaving the car are provided. The control may, however, be arranged for attendant operation in which an attendant in the car has sole control over the closing of the car and hoistway doors and the starting of the cars, with the landing stops remaining automatic in response to the actuation of the landing and car operating device.

Work on a national safety standard for elevators, dumbwaiters, and escalators was started by the American Society of Mechanical Engineers with the assistance of the National Bureau of Standards, elevator manufacturers, casualty insurance companies, and other interested groups in 1917. The committee set up by the ASME completed a draft of the standard in 1920 which was approved by the ASME and published in January, 1921 as a Safety Code for Elevators. This formed the basis for a number of city and state elevator safety codes.

When the American Standards Association (then the American Engineering Standards Committee) extended its work in 1921 to include safety standards, the American Society of Mechanical Engineers requested that, in view of rapid development of elevator technology, the elevator standard should be revised under ASA procedure. At that time, the American Institute of Architects and the National Bureau of Standards, together with the ASME, became the sponsors of the standard.

A sectional committee representing all of the groups having a major interest in the elevator industry was formed and, after several years of intensive work, the first edition of the American Standard Safety Code for Elevators was prepared. After approval by the sectional committee, the three sponsors, and ASA, the standard was published in 1925. This edition took cognizance of the increasing speeds required by the increase in the height of buildings and included certain standards of performance for vitally necessary

safety equipment. At the time the 1925 edition was published, the Woolworth Building in New York City was the tallest building and had the fastest elevators in the country, 700 ft per minute.

Revised editions of the standard published in 1937 and 1955 included additional requirements for the design of the equipment to ensure safe operation at the higher rises and speeds necessary to provide adequate service in the very tall buildings being erected in practically all cities in the country. These revisions provided requirements for rated car speeds as high as 1500 feet per minute.

The revisions to the safety standard approved in 1960 are the result of experience with the standard in the field, and are principally based on communications sent to Sectional Committee A17 by enforcement officials, manufacturers, installers, and owners of the equipment covered by the standard.

Also, new rules have been added to cover the latest developments in design of elevator equipment. Following are some of the most important changes:

(1) Provision for a new guide rail weighing 18½ lb per foot.

(2) Revision to permit installation of emergency key devices for unlocking hoistway doors in case of emergency, and use of emergency keys in place of access switches at the upper and lower landings to secure access to the top of the car for inspection, maintenance, and repair.

(3) Changes in rules for fireproofing wooden passenger elevator car platforms and car enclosures to permit the use of approved fire-retarding paint having a flame spread of not over 50, based on ASTM Specification E 84-59T.

(4) Rules requiring numbering of elevator machines where there is more than one machine in a machine room, and marking of the disconnect switch for each machine with the number of the machine it controls.

(5) Reduction from 7 feet to 5 feet 6 inches for the head room in machine rooms of hydraulic elevators in existing buildings.

(6) New rules requiring all welding of hydraulic elevator cylinders, plungers, piping valves, fittings, and tanks to conform to the standards of the American Welding Society and to be performed by welders qualified in accordance with the rules of the American Welding Society.

(7) Revision to permit the electrically released escalator brake to be located either on the driving machine or on the main drive shaft instead of only on the driving machine.

(8) Addition of rules covering requirements for wiring, disconnect switches, enclosure of electrical parts, and limitation of voltage for escalators.

(9) Clarification to indicate clearly which tests are to be made at the 12-month intervals specified.

(10) Addition of a new rule requiring fire extinguishers if provided in electrical machinery and control spaces to be of the carbon dioxide or other type approved for use in such spaces.

(11) Revision to permit replacement of wooden guide rails, which have become worn or damaged during the application of the car safety, by similar wooden guide rails.

(12) Addition of a new rule requiring a device to tie the car and counterweight together for car speeds of 800 feet per minute or more, in order to limit the jump of the car or counterweights as a result of buffer engagement or application of the car safety device.

The Inspectors' Manual is in three parts—Part I covers routine inspections and tests made at periodic intervals in conformity with laws or ordinances. It applies not only to new elevator installations but also to all existing elevators. Part II covers initial or acceptance inspections and tests of new or altered elevator installations. Part III covers escalators, and includes periodic or routine inspection and tests for both new and existing installations.

The new edition eliminates material applying to maintenance rather than to safety of operation. It also uses references to the sections of the standard rather than repeating them in the manual.

One of the changes that brings the Inspectors' Manual up to date recognizes the increasing use of automatic elevators, and adds rules for inspecting and checking operation of power-operated doors and their automatic reopening protective devices.

For the first time, a simple method has been made available to determine when wire ropes should be replaced.

New material has been added covering inspections to be made in machine rooms and in overhead machinery spaces, including safety precautions to be observed by the inspector making the inspections. Material covering the inspection of hydraulic elevators has been expanded to cover inspection of electrically controlled valves which are required by the new edition of the standard. Also, the material relating to car and counterweight safety tests and tests of car and counterweight oil buffers has been materially expanded and revised in line with the 1960 edition of American Standard Safety Code for Elevators, Dumbwaiters, and Escalators.

Part III of the manual covering inspection of escalators has been completely revised to conform with the 1960 edition of the standard.

In addition, many changes have been made to bring the several sections of the manual into line with the 1960 edition of the standard.

The new editions of these two important safety standards are now available: American Standard Safety Code for Elevators, Dumbwaiters, and Escalators, A17.1-1960, $3.75; American Standard Inspection of Elevators (Inspectors' Manual), A17.2-1960, $2.75.

How to choose and use your

POWER LAWN MOWER

Safely

BY HAROLD K. HOWE

THAT HUGE LAWN was a back-breaker last year? And you have decided to buy a power lawn mower to ease the burden? Then you will be glad to know that you can check whether it is designed and constructed for safe use by referring to American Standard Safety Specifications B71.1-1960.[1] Safety requirements for rotary-blade and reel power mowers, both walking and riding types, are specified to help eliminate that 10 percent of mower accidents that have been traced to unsafe design or construction. The angle of exposure of the discharge chute to prevent stones and twigs from being thrown out with great force (one of the hazards of rotary mowers), and the proper enclosure for the rotary blade, guarding for chain belts and gears, stability of riding mowers, braking, and drive controls—all these have been given special attention. To help reduce the 90 percent of mower accidents that are attributed to carelessness or ignorance of proper use of a mower, an appendix makes suggestions to users on purchasing, safe handling, and storage.

The standard is the result of more than five years of work by leading engineers of interested groups—work undertaken at the request of the Lawn Mower Institute, which also served as sponsor under the procedures of the American Standards Association.

Soon after the Lawn Mower Institute was incorporated in 1952, the problem of accidents resulting from the use of power mowers became its prime concern. The Institute is the national trade association for the lawn mower manufacturers, and its purpose is to promote the welfare both of the industry and of the general public. Therefore, the Institute made strenuous efforts to secure all the information possible from all available sources about lawn mower accidents. As a result of this effort, it became evident very quickly that approximately 90 percent of all power mower accidents are the result of carelessness or ignorance; 10 percent were either freak accidents

Charles Phelps Cushing

or ones which might have been avoided by better construction.

The first step to solve this problem was to start a program of user education. This was done by developing a small Safety Guide leaflet or card setting forth the 12 most essential guides for the safe use and operation of power lawn mowers. As a result of this program, millions of copies of the leaflets have been purchased by the Institute and distributed at cost to mower manufacturers to be included in shipping cartons to distributors and dealers, to be used as handouts at country fairs, to be sent to companies and safety engineers, and to be made available to Government departments and agencies. In addition, many articles on safe operation of lawn mowers were written for trade journals and consumer publications, and the Institute collaborated with Government agencies, the medical profession, and others in development of articles on safety for monthly bulletins and house organs, and for presentation at medical meetings.

Even one accident is one too many, the Institute believes. Therefore, the Institute members decided to do something about the 8 or 10 percent of accidents which would not be affected by this user education. The answer, it was decided, would be a safety standard developed from the point of view of design and specifications.

Investigation convinced the Institute that the sectional committee procedures of the American Standards Association were best suited to the needs of the problem, and it requested ASA to organize a project. When ASA approved the project on March 15, 1955, the Institute was invited to serve as spon-

MR HOWE is executive secretary of the Outdoor Power Equipment Institute (formerly the Lawn Mower Institute.)

[1] American Standard Safety Specifications for Power Lawn Mowers, B71.1-1960, can be obtained from ASA at $1.00 per copy.

sor. The scope was defined as: "Safety requirements for lawn mowers of reel- or rotary-blade type operated by hand power, internal combustion engines, or electric motors."

It was decided to put special effort first on the rotary-type power lawn mower because more mowers of this type were in use and consequently more accidents could be attributed to it. As in the case of a safety standard for any complex mechanical device, the goal for this standard was to provide maximum safety for the user and the general public, consistent with efficiency in doing the job for which the equipment is made, and at a price the public will pay. Also, the standard had to be written in such a way that it would provide safety without drastically inhibiting the ingenuity and design of the producers. Before the work on the new standard was finished, rotary riding power mowers were also considered, as well as reel-type power mowers, both walking and riding types.

In preparing the standard, the Engineering Specifications Subcommittee assembled all records of accidents involving lawn mowers and classified them by type and area of the lawn mower involved. This compilation guided the subcommittee in its work.

One area shown to be involved in accidents was the discharge chute from which the cut grass is ejected from under the housing or deck. Twigs and other foreign matter are frequently thrown from the discharge chute. Therefore, Section 2.1.3 of the new standard is devoted to a formula for the angle of exposure of the discharge chute. This will provide maximum safety to the operator and by-standers without unduly clogging the mower.

Next, the question of the rotary blade enclosure and exposure are considered. This will protect operators and others from the rotary blade by designing the deck and discharge chute in relation to the blade's plane of rotation. Additional requirements regarding guards for the blade and calling for precautionary words of warning near the hazardous points on the mower have been written into the standard.

The standard also covers mandatory material requirements for the steel used in the blades of rotary mowers. Multipiece blades are covered by a construction requirement. It was found that some accidents have resulted from blades breaking or chipping; therefore, exhaustive tests have been established as a requirement. Wear tests are required to prevent the bolt or rivet used in fastening multipiece blades from wearing out before the cutting members. Strength tests for blade and blade mounting, sudden impact tests, repeated impact tests, imbalance tests, and reverse torque tests have all been developed and written into the safety standard to provide as safe a blade as possible without requiring rigid dimension design. Not only must the blade withstand these tests but the whole structure of the mower must be such as to prevent breakage, loosening, or deformation during these impact tests and other strength tests.

On electric-powered rotary mowers, an audible or visible indication of blade rotation is recommended.

The maximum speed of the tip of the blade is set at 21,000 feet per minute. Where mowers are equipped with a blade throw-out clutch, they must have a positive braking means to stop the rotation of the blade.

Requirements for fastenings and automatic upstops of walk-behind mower handles are spelled out in detail in Section 2.2.7 of the standard; Section 2.2.9 covers wheel-drive controls and safeguards.

Riding rotary mowers have been given careful consideration. Special attention has been given to steering-handle fastenings, foot-pedal or hand-lever clutch controls, and the reverse-drive control. Guarding is required for chain belts and gears to prevent personal injury. In riding mowers, stability is a most important safety factor; and, therefore, requirements have been set forth and tests devised for lateral stability, longitudinal stability, and stability in turns. Means for braking wheels are required, and adequate stops are called for to prevent jackknifing of sulky powered-type rotary riding lawn mowers.

Reel-type power mowers were found to have been the source of exceptionally few accidents. Nevertheless, the new specifications have requirements for wheel drive controls and for guarding chain belts and gears.

The new American Standard safety specifications for power lawn mowers require all power lawn mower manufacturers to supply with each mower the Lawn Mower Institute's Safety Guide or a substantial equivalent.

Again in the effort to educate users in the safe and proper use of power lawn mowers, the Lawn Mower Institute, as sponsor of the B71 project, insisted that an appendix be included in the printed standard covering safety suggestions for users on such subjects as mower purchase, training operators, preparation of the lawn to be mowed, operation of the mower, and finally, maintenance and storage—in all, 41 important safety commandments for power lawn mower users.

So, now, there is an American Standard providing safety specifications for power lawn mowers. The standard will not immediately eliminate all accidents. Carelessness is still responsible for more than 90 percent of the accidents involving lawn mowers. Also, many mowers were designed before the standard was printed, and more than 20,000,000 power lawn mowers produced in previous years are now in use. That is more than one power lawn mower for every three passenger automobiles. Today, with such a large number of power lawn mowers in use, the accident rate—less than one-half of one percent of the power mowers in use—is exceedingly low. We confidently expect it will be even lower in the future.

CROSS-INDEXING

Industry and Military Specifications and Standards

Reported by W. L. Healy

In the February and March issues of *The Magazine of Standards*, under the above heading, industry was encouraged to cooperate with the Bureau of Ships in its current project of indexing comparable industry and military specifications. Comment by industry was encouraged on the basis that many companies' own evaluation between industry and government specifications would constitute an invaluable supplement to the work being done by the American Standards Association under its current contract with the Bureau of Ships. This work could be accelerated thereby, with mutually beneficial results. Since this index will be made available to industry at large, much expense in both time and money will be saved by the individual companies when unnecessary and repetitive work is eliminated.

It is again suggested that when any company becomes aware of an instance where an adequate and comparable industry standard or specification, such as AIA, ASTM, NEMA, AISI, or any others, or an American Standard, can be substituted for a military document, it be brought to the attention of W. L. Healy, staff engineer, American Standards Association, 10 East Fortieth Street, New York 16, N. Y.

The following are some recent examples of work performed under the contract:

Note: Item 1, page 57, February, 1961, should read "QQ-S-624A." It was incorrectly given as "QQ-S-634A."

(1) QQ-B-626a—BRASS, LEADED AND NON-LEADED; RODS, SHAPES, FORGINGS AND FLAT PRODUCTS WITH FINISHED EDGES (BARS, FLAT WIRE AND STRIPS) 10/29/1957

ASTM B36-56 alloys 8, 6, 4, and 3 are comparable to Federal Specification QQ-B-626a compositions 1, 2, 3, and 4, respectively.

ASTM B283-53T "Forging Brass" is comparable to federal specification QQ-A-626a composition 21.

ASTM B16-58 is comparable to federal specification 22. The ASTM specification does not cover forgings.

ASTM B121-60 alloy 5 is comparable to federal specification composition 24.

Any specific requirements in regard to sampling, packaging, inspection, etc should be specified in the ordering data.

The above ASTM specifications can be used for procurement.

(2) MIL-B-16261A—BRONZE, BEARING, CASTINGS 10/22/1959

Four alloys, 3A, 3B, 3D, and 3E, listed in ASTM B144-52 are comparable to MIL-B-16261A alloy grades II, VI, IV, and V, respectively, and can be substituted for the military specification for procurement purposes. There are, however, a few minor differences in the chemical requirements:

ASTM B144-52 alloy 3A allows a copper range of 78-82%, tin 9-11%, lead 8-11%, nickel .75%, phosphorus .05%, antimony .55%, while MIL-B-16261A grade II has copper range of 82-85%, tin 7.0-9.0%, lead 7.0-9.0%, nickel 1.0%, phosphorus .50% maximum, antimony .50% maximum.

ASTM alloy 3D has phosphorus .05% max, tensile 25,000 psi and elongation of 10% minimum in 2 in., while grade IV has .25% max phosphorus, tensile 20,000 psi and elongation of 10%.

ASTM alloy 3B has iron maximum of .20% and nickel .50%, a tensile of 30,000 psi and minimum elongation in 2 in. of 12%, while military specification grade VI has a maximum of .50% iron and 1.0% nickel, a tensile of 30,000 psi and minimum elongation of 18.0%.

ASTM allows a lead range of 22.0-25.0% and maximum nickel of .75%, a tensile of 21,000 psi and minimum elongation of 7%, while military specification grade V has lead range of 23.0-26.0% and .50% nickel and the same tensile and elongation as its comparable ASTM specification alloy 3E.

Any specific requirement in regard to chemical and physical characteristics could be subject to negotiation at time of procurement.

Any specific requirements in regard to sampling, packaging, inspection, etc should be indicated in the purchase order.

(3) MIL-S-15083B—STEEL CASTINGS 11/7/1960

ASTM A27-58 grades U-60-30, 60-30, 64-35, and 70-36 are comparable to MIL-S-15083B class CW, B, 65-35, and 70-36, respectively, and can be substituted for procurement.

ASTM A148-58 grades 80-40, 80-50, 90-60, 105-85, 120-95, and 150-125 are comparable to the military specification classes 80-40, 80-50, 90-60, 105-85, 120-95, and 150-125, respectively, and can be substituted for procurement. MIL-S-15083B class CW permits .30% carbon, .70% manganese, .07% phosphorus, while ASTM grade U-60-30 permits maximum .25% carbon, .75% manganese, .05% phosphorus, and .80% silicon.

The military specification class 80-40 provides a minimum elongation in 2 in. of 17% and minimum reduction in area of 25%, while ASTM grade 80-40 permits a minimum elongation in 2 in. of 18% and a minimum reduction in area of 30%.

The military specification provides that, unless homogenization is required, the castings be heated at controlled rate of temperature 1850-2350 F and held at this temperature sufficient time to minimize harmful heterogeneity by diffusion. This treatment is to be followed by annealing, normalizing and tempering, or quenching and tempering.

Any specific requirements, particularly in regard to quality assurance, sampling, inspection, or packaging, should be indicated in the purchase order.

(4) MIL-A-17375B—ALUMINUM ALLOY 5154 (A54S) PLATES AND SHEETS 5/6/1955

ASTM B209-60T tempers—O, H32, H34,

H36, H38, and H112—are equivalent to military specification MIL-A-17357B tempers O, H32, H34, H36, H38, and H112, and can be used for procurement.

Mechanical properties and tolerances for sizes or thickness of plates or sheets not specifically covered in this specification should be specified in the ordering data.

Any special requirements particularly in regard to sampling, inspection, or packaging should be specified in the ordering data.

(5) QQ-A-357A—ALUMINUM ALLOY BARS, RODS AND SHAPES, EXTRUDED, 3003 6/1/1960

ASTM B221-58T tempers—O and F2—are comparable to the military specification QQ-A-357A in regard to chemical and physical characteristics, and can be substituted for QQ-A-357A for procurement.

Sizes not specifically covered, and mechanical properties and tolerances of material falling outside the limits of the specification should be specified in contract or purchase order.

Any specific requirements in regard to sampling, packaging, and inspection should be specified in the purchase order.

(6) QQ-A-325B—ALUMINUM ALLOY BARS, RODS, WIRE AND SPECIAL SHAPES; ROLLED, DRAWN, OR COLD FINISHED, 6061 6/20/1960

ASTM B211-60T alloy GS11A, AA6061 (Aluminum Association) tempers O, T4, and T6 are equivalent to Federal Specification QQ-A-325B tempers O, T4, and T6. Tempers T451 and T651 shown in the Federal Specification are not listed in the industry specification: T451—solutions heat-treated, and stress-relieved by stretching, etc; T651—solutions heat-treated, and stress-relieved by stretching, etc. These two tempers when required may be subject to negotiation at time of purchase.

Any specific requirement particularly in regard to sampling, packaging, or inspection should be indicated in the purchase order.

(7) QQ-A-315B—ALUMINUM ALLOY BARS, RODS, WIRE: ROLLED, DRAWN, OR COLD FINISHED, 5052 6/20/1960

ASTM B211-60T alloy GR20A is comparable to QQ-A-315B AA5052 (Aluminum Association) and can be substituted for procurement.

Tempers H32, H36, are not listed in the ASTM standard. These can be had if required by agreement at the time of purchase.

Any specific requirements, particularly in regard to sampling, packaging, and inspection, should be indicated in the purchase order.

(8) QQ-P-330—PHOSPHOR BRONZE BARS, PLATES, RODS, SHEETS, STRIPS, FLAT WIRE, AND STRUCTURAL AND SPECIAL SHAPED SECTION 5/27/1957

ASTM B103-60 alloys A and D are equivalent to Federal Specification QQ-P-330 composite A and D in regard to chemical and physical requirements and Rockwell hardness scale and can be substituted for procurement of phosphor bronze, bars, plate, sheet, strip, and rolled bar.

ASTM B139-55 alloys A and D are equivalent to Federal Specification QQ-P-330 alloys A and D in regard to chemical and physical requirements and can be substituted for procurement of phosphor bronze, bars, rods, and shapes.

Any specific requirements in regard to sampling, packaging, and inspection should be specified in the ordering data.

(9) MIL-S-867A—STEEL CASTINGS, CORROSION RESISTING AUSTENITIC 12/7/1951

ASTM A351-60T grades CF8, CF8C, and CF8M are comparable to compositions class I, II, and III, respectively, and can be substituted for procurement. The chemical and physical requirements are the same. The military specification calls for annealing. The military specification requires that annealing be obtained by heating uniformly at a temperature not less than 1950 F for one hour for each 1 in. thickness of the heaviest section but in no case less than 30 minutes. The military specification requires test for precipitated carbides (intergranular corrosion).

(*a*) Specimens of class II castings intended for corrosion resistance service should be sensitized by heating within range of 1240 to 1260 F for 30 minutes.

(*b*) Specimens of class II castings intended for heat resistance service should be sensitized by heating within the range of 1020 to 1050 F for 48 hours. Specimens should be cooled in air and pickled to remove any scales which may have formed.

Specific requirements, particularly in regard to special tests, packaging, sampling, and inspection, should be specified in the ordering data.

(10) QQ-C-533—COPPER-BERYLLIUM ALLOY STRIP 9/3/1957

ASTM B194-55 is comparable to Federal Specification QQ-C-533 conditions A, ¼H, ½H, and H. The chemical and physical requirements are equivalent. The material furnished under this ASTM specification will conform to the applicable requirements of this "general requirement" for wrought copper and copper alloy plate, sheet, strip, and rolled bar (ASTM Designation: B248).

Any specific requirements in regard to sampling, packaging, and inspection should be specified in the ordering data.

(11) QQ-A-367d-ALUMINUM-ALLOY FORGINGS, HEAT-TREATED 4/27/1956

ASTM B247-60T alloys 2014, T4; 2014, T6; 2018, T61; 2025, T6; 2218, T61; 4032, T6; 6061, T6; 6151, T6; 7075, T6 are comparable to QQ-A-367d same alloys and tempers with the following exception:

1. All of the above alloys are equivalent in chemical properties.

2. Alloys 2014, T6 and 4032, T6 differ in the required tensile properties. Federal specification QQ-A-376a alloy 2014, T6 requires a tensile strength of 52,000 psi, minimum yield 42,000 psi and elongation of 5% while the ASTM B247-60T requires tensile of 65,000 psi, yield of 55,000 psi and elongation of 10%.

Federal specification alloy 4032, T6 requires a tensile of 65,000 psi, yield of 55,000 psi and elongation of 10% while the ASTM alloy requires tensile of 52,000 psi, yield of 42,000 psi, and elongation of 5%.

3. The ASTM specification B247-60T does not include alloys 2017-4, 7076, T61 and X7079-T6 listed in Federal Specification QQ-A-367d.

The federal specification includes both die forgings and hand or Smith forgings.

The ASTM specification lists die forgings only.

Any specific requirement in regard to sampling, inspection, and packaging should be specified in the data for ordering.

(12) MIL-B-16444-BRONZE, HYDRAULIC (OUNCE METAL): CASTINGS 7/30/1951

ASTM B62-60 composition bronze is equivalent to MIL-B-16444 dated 30 July 1951 and could be used for procurement.

The chemical and mechanical properties are equivalent.

Any specific requirement in regard to sampling, inspection, or packaging should be specified in the ordering data.

(13) QQ-A-591b—ALUMINUM ALLOY DIE CASTINGS 8/28/1958

ASTM specification B85-60 Aluminum Base Die Castings alloys S12B, S12A, S5C, G8A, SC84A, SC84B, SG100B, SG100A, SC114A, are comparable to federal specification alloys Nos. 13, A13, 43, 218, A38, 380, 360, A360, and 384, respectively. Alloy B214 is not listed in the ASTM specification. Some slight differences in chemical compositions are noted in compositions 13, A13, 43, 360, and A360. The federal specification permits in each a maximum of 0.3% manganese and 0.1% tin while the comparable ASTM alloys S12B, S12A, and S5C, SG100B, and SG100A each permit a maximum of 0.35% manganese and 0.15% tin. Federal specification alloy 218 permits 0.2% copper, 0.3% silicon, 1.8% iron, 7.5-8.5% magnesium, 0.3% manganese, 0.1% zinc, 0.1% nickel, and 0.1% tin; the ASTM alloy G8A allows 0.25%

Cross-Indexing (Continued)

copper, 0.35% silicon, 1.8% iron, 7.5-8.5% magnesium, 0.35% manganese, 0.15% zinc, 0.15% nickel, and 0.15% tin. Federal specification alloys A380 and 380 and their comparable ASTM alloys, SC84A and SC84B, are equivalent, except that where the federal specification permits 1.0% zinc and 0.3% tin the ASTM specification allows 3.0% zinc and 0.35% tin.

Federal specification alloy 384 is comparable to ASTM specification alloy SC-114A except that where the federal specification permits a range of 11.5-13.0% silicon, 1.0% iron, 0.6% manganese, 1.2% zin, 0.6% nickel, and 0.3% tin the ASTM specification permits 10.5-12.0% Si, 1.3% Fe, 0.5% Mn, 1.0% Zn, 0.5% Ni, and 0.35% tin. The mechanical properties are equivalent except that the federal specification alloy 218 requires a yield strength of 27,000 psi and an elongation in 2 in. of 8.0% while the ASTM comparable alloy G8A has a yield of 28,000 psi and an elongation in 2 in. of 5%. The above alloys in the ASTM specification could be used for procurement.

Any specific requirement particularly in regard to sampling, inspection or packaging should be specified in the ordering data.

(14) QQ-A-371c-ALUMINUM ALLOY INGOT, (FOR REMELTING) 10/30/1957

ASTM B179-60, Committee B-7, is a comparable specification and could be used for procurement for compositions as indicated in the following cross index:

Compositions Fed. Spec. QQ-A-371c	Alloys No. ASTM B179-60
(1) A	S5A
(2) B	SG70A
(3) C	C4A
(4) D	CS42A
(5) E	G4A
(6) F	CN42A
(7) G	CG100A
(8) H	CS43A
(9) I	SC64D
(10) J	CS72A
(11) K	SC51A
(12) L	SN122A
(13) M	SC122A
(14) N	G10A
(15) O	ZG61A
(16) P	NOT LISTED
(17) Q	SC82A
(18) R	NOT LISTED
(19) S	GM70B
(20) T	ZG32A
(21) U	ZG42A
(22) X	ZG61B
(23) Y	ZC81B
(24) Z	ZC60A
(25) B Spec	NOT LISTED
(26) K Spec	NOT LISTED
(27) AA	NOT LISTED
(28) BB	SC64C
(29) CC	SG100AB
(30) DD	G8A
(31) EE	S12AB
(32) FF	GS42A

The ASTM specification does not list the mechanical property requirements. Any specific requirement in regard to packaging, sampling, marking, or inspection should be specified in the ordering data.

STANDARDS FROM OTHER COUNTRIES

Members of the American Standards Association may borrow from the ASA Library copies of any of the following standards recently received from other countries. Information about those standards not selected for listing in THE MAGAZINE OF STANDARDS may also be obtained from the ASA Library. Orders for these standards may be sent to the country of origin through the ASA office. Titles are given here in English, but documents are in the language of the country from which they were received. For the convenience of readers, the standards are listed under their general Universal Decimal Classification number. In ordering copies, please refer to the number following the title.

621.798 PACKING AND DISPATCH. PACKAGING

France (AFNOR)

Corrugated cardboard boxes for packaging frozen food NF H 13-004

2 stds for details of closing arrangement for corrugated steel drums NF H 31-251/254

Germany (DNA)

6 stds for cylindrical jars, different sizes for preserved food DIN 6044

Swinging bottle-closing caps DIN 5098

India (ISI)

Milk bottle crates IS:1613-1960

Steel drum and kegs (galvanized and ungalvanized) IS:1549-1960

USSR

Petroleum products. Packing and marking. Storage and transportation GOST 1510-60

Corrugated cardboard boxes for bobbins with man-made rayon GOST 9481-60

Corrugated board boxes for radio equipment of general use GOST 4112-60

Corrugated board boxes for electric lamps GOST 5884-60

621.8 MATERIAL HANDLING

Germany (DNA)

Wooden collapsible boxes for pallets DIN 15148

Czechoslovakia (CSN)

Platform elevator for wooden constructions CSN 73 8140

Finland (SFS)

Ropegear for cranes E.II. 11

Track and anchor cable for cranes E.II. 12

2 stds for maximum load of crane ropes and minimum diameters of pulleys and drums E.II. 14/15

Wire rope sheaves for cranes E.II. 16

United Kingdom (BSI)

Electric overhead traveling cranes for general use in factories, workshops, and warehouses BS 466:1960

Permissible stresses in cranes. Structures BS 2573:Part 1:1960

Pallets for materials handling BS 2629:1960

USSR

Flat timber pallets. Strength test methods GOST 9495-60

621.822 BEARINGS

Germany (DNA)

4 stds for roller bearings DIN 5412

France (AFNOR)

Needle bearings. Identification, dimensions NF E 22-371

USSR

Needle roller bearings GOST 4060-60

Needle roller bearings. Types. Boundary dimensions GOST 4657-60

629.113 MOTOR CARS. AUTOMOBILE ENGINEERING

Czechoslovakia (CSN)

Emergency trucks for road repair and motor cars, accessories, equipment, outfit. Definitions CSN 30 0025

Inner tubes for automobile tires CSN 63 1421

France (AFNOR)

Spark plugs and accessories NF R 133-14

Germany (DNA)

Air filters for i.c. motors, dimensions of connection pipe DIN 73351

Israel (SII)

Automobile parts: clutch lining S.I. 343

666 GLASS AND CERAMIC INDUSTRY

Germany (DNA)

Determination of deflection angle and refraction index of safety glass DIN 52305

Testing of safety glass by falling-dart method DIN 52307

Testing of safety glass by ball-drop method DIN 52306

Impact testing of enamel DIN 51155

India (ISI)

Glass liquor bottles IS:1662-1960

Israel (SII)

Pharmaceutical glass bottles S.I. 277

Glass containers for soda-water syphons S.I. 339

Union of South Africa (SABS)

Glass bottles for the liquor trade SABS 617-1959

United Kingdom (BSI)

Specification for vitreous enamel finishes, Group A: Kitchen equipment

Resistance to thermal shock BS 1344:Part A1:1960

Resistance to culinary acids BS 1344:Part A2:1960

Glass for signs and recommendations on glazing for signs BS 3275:1960

674 WOOD INDUSTRY

Australia (SAA)

Guarding and safe use of woodworking machinery CZ.10-1960

Radiata pine, sawn qualities for dressing and mill products 0.72-0.75-1960

India (ISI)

Coniferous sawn timber intended for further conversion IS:190-1960

Grading of cut sizes of timber IS:1629-1960

Plywood for general purposes IS:303-1960

United Kingdom (BSI)

Specifications for connectors for timber BS 1579:1960

Specifications for carpenters' squares and bevels BS 3322:1960

677 TEXTILE AND CORDAGE INDUSTRY

Germany (DNA)

Asbestos yarns DIN 60650

Glass yarns DIN 60850

Rules for description of fabrics DIN 61100

Testing of synthetic fabrics, yarn count DIN 53812

Testing for colorfastness of textiles to iron and copper ions in the dyebath DIN 54053

2 stds for testing of dyeings and printings for colorfastness to potting and cross-dyeing DIN 54048/9

Spinners' draft rollers, definition of and arrangement of components DIN 64050

India (ISI)

Scouring loss in grey and finished cotton textile materials IS:1383-1960

Cotton fiber immaturity count by polarized-light method IS:1611-1960

Handloom cotton twills, bleached or dyed IS:1579-1960

Handloom silk dhoties, loomstate IS:1583-1960

Handloom silk shirting, loomstate IS:1584-1960

Union of South Africa (SABS)

Blazer cloth SABS 271-1960

Woollen flannel SABS 415-1960

Worsted gabardine SABS 705-1960

Worsted suitings SABS 267-1960

Knitting wool SABS 576-1960

United Kingdom (BSI)

Method for measurement of the equivalent pore size of fabrics BS 3321:1960

USSR

Retted hemp GOST 6729-60

677.72 WIRE ROPES

Finland (SFS)

Normal type wire ropes B.VI. 36

Seal- and Warrington-type wire ropes B.VI. 37

Non-spinning steel wire ropes B.VI. 38

Germany (DNA)

Wire ropes—definition, terminology DIN 6891

678 MACROMOLECULAR MATERIALS

Australia (SAA)

Plastics moulding CK.6-1960

United Kingdom (BSI)

Specification for toughened polystyrene extruded sheet BS 3290:1960

Specification for PVC (vinyl) asbestos floor tiles BS 3260:1960

744 TECHNICAL DRAWINGS

Finland (SFS)

Sheet sizes and scales B.II. 1

Title blocks and part lines B.II. 61

Germany (DNA)

2 stds for graphical symbols for indicating surface finish DIN 3141/2

USSR

Engineering drawings. Conventional representation of splines and serrations GOST 9510-60

77 PHOTOGRAPHY AND CINEMATOGRAPHY

Germany (DNA)

Flash lamps DIN 19012

17.5-mm and 35-mm magnetic film DIN 15538

35-mm motion-picture projector lenses, optical data DIN 15741

Cans for 35-mm motion-picture films DIN 15521

Damages to motion-picture films: glossary and conventional symbols DIN 15581

Japan (JISC)

Distance scale marking on photographic lenses JIS B 7105

Picture size of roll-film cameras JIS B 7115

Mounting thread and flange focal distances for 8-mm and 16-mm motion-picture camera lenses JIS B 7127

Spindles for spools of 8-mm motion-picture cameras JIS B 7130

Distance scale marking on lenses of 8-mm and 16-mm motion-picture cameras JIS B 7131

Sound motion picture 16-mm projector JIS B 7164

2 stds for lenses for 35-mm and 16-mm projectors JIS B 7167/8

3 stds for microfilm readers, method of copying JIS B 7186/8

Dimensions of roll-film J 35 JIS K 7513

Dimensions of X-ray films JIS K 7521

Dimensions of printing paper for X-ray photography JIS K 7524

Dimensions of photographic dry plates JIS K 7526

3 stds for dimensions of 35, 16, 8-mm cinema film (Nega) JIS K 7552/4

United Kingdom (BSI)

Sodium thiosulphate hydrated, photographic grade BS 3301:1960

Sodium thiosulphate anhydrous, photographic grade BS 3302:1960

Sodium sulphite hydrated, photographic grade BS 3303:1960

Sodium sulphite anhydrous, photographic grade BS 3304:1960

Sodium carbonate anhydrous, photographic grade BS 3305:1960

Potassium metabisulphite, photographic grade BS 3306:1960

Potassium bromide, photographic grade BS 3307:1960

Sodium hydroxide, photographic grade BS 3308:1960

Benzotriazole, photographic grade BS 3309:1960

Ammonium thiosulphate solution, photographic grade BS 3310:1960

USSR

2 stds for Fresnel type spot projectors GOST 9507/8-60

• NEWS BRIEFS

• AT A MEETING in February, representatives of interested groups recommended that the American Standards Association adopt full participating status in ISO Technical Committee 8, Shipbuilding Details. This action is being sent to maritime organizations in this country for their review and endorsement by letter ballot. ISO/TC 8 has been in operation for many years and has numerous projects under consideration which are in various stages of completion.

A U.S. Advisory Committee is already at work, with the following members: American Society for Testing Materials; Aluminum Association; Bureau of Ships, Department of the Navy; Committee of the American Steamship Lines; Society of Naval Architects and Marine Engineers; Bureau of Labor Standards, U.S. Department of Labor; and the U.S. Maritime Administration.

Subjects now under study in ISO/TC 8 have been allocated to the different organizations which have the primary interest; for example, "lifeboats" has been assigned to the Society of Naval Architects and Marine Engineers, which already has set up a technical committee to study the problem. "Cargo handling accessories" has been allocated to the U.S. Department of Labor, Bureau of Labor Standards, since this subject concerns the safety of operating personnel in loading operations.

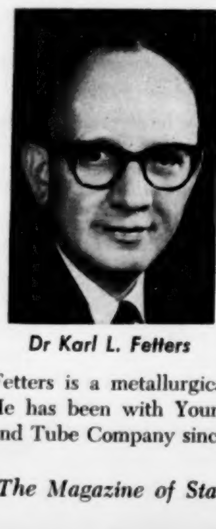
• STANDARD specifications and dimensions are among the most important means for developing a nation's industries, the Middle East Standardization Conference pointed out early this year. The conference was held in Cairo, Egypt, from January 30 to February 5, 1961. Calling for action to develop the industries of the Middle East countries in order to raise the standard of living in these countries, the conferees adopted recommendations along the following lines:

1. Expedite establishment of national standardization organizations in those countries which have not yet formed them. These organizations should immediately join the International Organization for Standardization, as well as other international organizations concerned with specifications and measurements, particularly the International Organization for Legal Metrology. They should participate actively in the work of the technical committees of these international organizations, in order to gain experience and to support international industrial cooperation.
2. Request national and international organizations to give financial and technical assistance to help establish standards bodies in those countries which have not yet done so.
3. Work to bring about coordination and unification of standardization systems in member countries in cooperation with the international organizations, to develop the industries in these countries, and to raise the standard of quality of their production.
4. Adopt the metric system of measurements in those countries which have not yet adopted it, since this system is characterized by its simplicity and ease of application and is suitable for use by developing countries.
5. Organize symposia and training courses in all member countries in which interested workers will participate—in the field of specifications, measurement, technical inspection, and quality control. The aim should be coordination between the different systems according to international agreements in these fields.
6. Take immediate action to train personnel at all levels for work on specifications and measurement, and to lay down a special system for interchange of specialists. This should be carried out by cooperation with national and international organizations.
7. To make it possible for the Arab states to benefit from international efforts on specifications and measurements, establish a technical committee to work in cooperation with other organizations concerned with unification of scientific and technical Arabic terms. The committee's task would be to define, specify, and unify scientific and technical Arabic terms used in specifications and measurements. The committee should also work toward unification of Arabic writing used in engineering drawings and of figures and tolerance nomenclature, together with unification of the rules for transliteration of Arabic into Latin.
8. Oppose monopoly in science and invention which hinders economic progress in recently developed countries, and strive for international cooperation in interchange of technical and scientific knowledge.
9. Ask the international organizations and the atomic energy committee of the International Organization for Standardization to take positive steps to ensure that water, air, agricultural products, and industrial products will not be contaminated with atomic radiations and will comply with standard specifications. Request the different countries to restrict atomic research to those branches that will lead to progress and peace for science, industry, and mankind.

The United States was represented at the conference by John R. Townsend, president of the American Standards Association. Mr Townsend attended as the technical representative of the U.S. Department of Commerce and consultant to the director of the National Bureau of Standards, as well as representative of ASA. Dr Ruby K. Worner, visiting Fulbright lecturer and consultant at the University of Alexandria, Egypt, also attended as an accredited ASA delegate. Both Mr Townsend and Dr Worner presented papers.

The Egyptian Standards Association, which acted as host for the conference, is a member of the International Organization for Standardization.

• DR KARL L. FETTERS, vice-president—research and development, The Youngstown Sheet and Tube Company, has become a member of ASA's Board of Directors. Dr Fetters was nominated by the American Iron and Steel Institute to succeed E. R. Johnson, vice-president—operations, Republic Steel Corporation.



Dr Karl L. Fetters

Dr Fetters is a metallurgical engineer. He has been with Youngstown Sheet and Tube Company since 1936,

with the exception of several years when he was research assistant and national Open Hearth Fellow at the Massachusetts Institute of Technology, and later assistant professor and staff member of the Metals Research Laboratory, Carnegie Institute of Technology. Here, he was in charge of the Office of Scientific Research Development project on seamless gun tubes.

Dr Fetters is president-elect of The Metallurgical Society of the American Institute of Mining and Metallurgical Engineers.

He is a member of the General Research Committee of the American Iron and Steel Institute, and is an active member of the American Society for Metals. He was chosen by the Society as the first Marcus A. Grossman lecturer, and represented the Society at the Joint Metallurgical Conferences in Europe in 1955. Dr Fetters is a member of a number of European societies as well as American societies.

• TECHNICAL COMMITTEE 4 on Ball and Roller Bearings of the International Organization for Standardization will study a number of basic problems at its meeting in Turin, Italy, May 8-15. Working groups concerned with development of an international identification code for bearings, tolerances, instrument bearings, tapered roller bearings, and needle bearings are scheduled to meet. Subcommittee 3 on airframe bearings also has scheduled a two-day meeting.

The program of work outlined for consideration by ISO/TC 4 includes:

1. Unification of existing or projected national standards for rolling bearings.
2. Boundary dimensions of bearing units, bearing subunits, and bearing parts so far as such units, subunits, and parts are or may be marketed separately.
3. Tolerances of above-mentioned dimensions in respect of size and of form of boundary surfaces.
4. Properties of bearings as far as they influence the motion of machine parts carried by the bearings, such as running accuracy, internal clearance, and friction torque.
5. Methods of evaluating bearing properties, such as load-carrying capacity, fatigue life, and friction torque.
6. Boundary dimensions and tolerances of bearing accessories, such as mounting sleeve units, locating rings, supporting washers and sealing devices, as far as they are outwardly adaptable to the bearings and are or may be marketed separately.
7. Boundary dimensions and tolerances of machine parts adjacent to the bearings and of space to be kept available for bearings and bearing accessories.
8. Identification of bearings, bearing parts, and bearing accessories by means of symbols.
9. Filing of dictionaries of terminology concerning rolling bearings issued by national standardization or other organizations and selection of terminology for use in ISO/TC 4 documents.

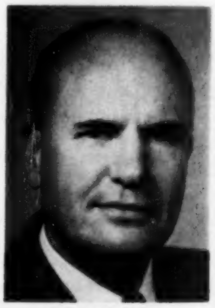
Draft proposals have been circulated to the participating members of the committee for study before the meeting.

The national standards body of Sweden holds the secretariat for this ISO project.

• NEW CHAIRMEN have taken office for two of the standards boards which supervise the American Standards Association's work on standards projects.

M. H. Pratt, vice-president and chief engineer, Niagara Mohawk Corporation, Syracuse, N.Y., is the new chairman of the Electrical Standards Board.

J. B. Rather, Jr, Socony Mobil Oil Company, Brooklyn, N.Y., is new chairman of the Materials and Testing Standards Board.



M. H. Pratt

Mr Pratt started work with his company, then the Syracuse Lighting Company, as a cadet engineer in 1926, the year he was graduated from the University of Pennsylvania with a degree in mechanical engineering. He has continued in the utility business in New York State ever since. In 1955, he became vice-president and chief engineer of the company, now the Niagara Mohawk Power Corporation, and in 1958 was elected a director.

In recognition of his active work with the American Institute of Electrical Engineers, both at the local level and on national technical committees, he was named a Fellow of the Institute in 1951. Mr Pratt is also a member of the American Society of Mechanical Engineers.

A licensed Professional Engineer in the State of New York, Mr Pratt has taken an active part from time to time in the affairs of the Society of Professional Engineers. For some years, he has been a member of various Edison Electric Institute technical engineering and operating committees.

Hendley Blackmon, Westinghouse Electric Corporation, and Virgil M. Graham, Electronic Industries Association, are vice-chairmen of the ESB.

James B. Rather, Jr

Mr Rather entered the petroleum industry in June 1933 as a process engineer for Max B. Miller and Company, pioneers in the development of the Duo-Sol Refining Process for lubricating oil manufacture. He is a chemical engineer with the degree of B.S. in Chemical Engineering from Lehigh University.

He joined the Socony Mobil Company in 1935. At the present time, he holds a dual position. He is administrative director of the Brooklyn Laboratory, as well as coordinator in charge of toxicology and air and water pollution for the over-all Socony Mobil Research Department.

For many years, Mr Rather has been active in both the American Petroleum Institute and the American Society for Testing Materials. He has held numerous committee chairmanships in both organizations. He is a member of the Advisory Committee of ASTM Committee D-2 on Petroleum Products and Lubricants, vice-chairman of Committee D-2 Technical Committee A on Gasoline, a member of the Administrative Committee on Standards, and a member of the Subcommittee on Long-Range Planning of ASTM.

G. H. Harnden is vice-chairman of the Materials and Testing Standards Board.

Re-elected chairmen of the other standards boards are:

Acoustical Standards Board, Leo L. Beranek, Bolt, Beranek & Newman, Inc, Cambridge, Mass.

Chemical Industry Advisory Board, J. G. Henderson, Union Carbide Chemicals Co, Division of Union Carbide Corp, Charleston, W. Va.

Construction Standards Board, J. Lloyd Barron, sanitary engineer, National Biscuit Company, New York, N.Y.

Consumer Goods Standards Board, Ephraim Freedman, Bureau of Standards, R. H. Macy & Co., New York, N.Y.

Graphic Standards Board, H. P. Westman, International Telephone and Telegraph Corp, New York, N.Y.

Highway Traffic Standards Board, G. D. Sontheimer, director, Department of Safety, American Trucking Associations, Inc, Washington, D.C.

Mechanical Standards Board, P. L. Houser, president, Metal Cutting Tool Institute, New York, N.Y.

Mining Standards Board, Paul T. Allsman, chief mining engineer, Bureau of Mines, U.S. Department of the Interior, Washington, D.C.

Miscellaneous Standards Board, G. H. Harnden, manager, Engineering Materials and Processes, General Electric Company, Schenectady, N.Y.

Nuclear Standards Board, Morehead Patterson, American Machine and Foundry Company, New York, N.Y.

Photographic Standards Board, Paul Arnold, assistant to technical director, Ansco, Division of General Aniline & Film Corp, Binghamton, N.Y.

Safety Standards Board, William P. Yant, director of research and development, Mine Safety Appliances Company, John T. Ryan Memorial Laboratory, Pittsburgh, Pa.

A new standards board is now being organized to handle projects on packaging and handling.

In addition, the president of the United States National Committee of the International Electrotechnical Commission is Hendley Blackmon, Westinghouse Electric Corporation, Philadelphia, Pa.

• REPRESENTATIVES of national cement products associations, technical societies, and government agencies have recommended initiation of a project on standards for vermiculite concrete. Vermiculite is a lightweight material used for insulation rather than for structural purposes. It is expected that the scope of the project will be concerned with the use of concrete containing vermiculite as the only aggregate. The conference recommended that the project be organized under the sectional committee method.

• HENRY G. LAMB, American Standards Association staff in charge of safety and nuclear energy projects, has been elected chairman of the National Committee on Films for Safety. Members of the committee are representatives of national associations and government agencies concerned with safety. The committee is responsible for selecting the best films made during the year on various phases of industrial, highway, and public safety. A bronze plaque is presented to the winning film in each category.

GAILLARD SEMINARS

Dr John Gaillard, consultant on industrial standardization, will hold his next five-day seminar from June 19 through 23, 1961, in the Engineering Societies Building, New York City. The Gaillard Seminars, intended primarily to assist companies in the organization of their standardization work and training of staff, have been attended so far by 436 representatives of 244 industrial concerns and governmental agencies.

If preferred, managements may also arrange for a Company Standards Seminar to be attended exclusively by their own men, at a time and place of their own choice.

For details on either kind of seminar, write to Dr John Gaillard, 135 Old Palisade Road, Fort Lee, New Jersey.

New Books . . .

ELECTRONICS AND NUCLEONICS DICTIONARY. ***By Nelson M. Cooke and John Markus. Sept. 1960. 543 pp. 6 x 9. 452 illustrations and diagrams. McGraw-Hill, 327 West 41st Street, New York 36, N.Y. $12.00.***

More than 13,000 terms used in the electronic and nucleonics fields are defined in this enlarged and updated edition. The new dictionary shows the exact meaning and correct usage of technical words, synonyms, and abbreviations currently being used in such areas as radio, radar, industrial electronics, medical electronic, avionics, space electronics, nuclear science, and nuclear engineering.

Many of the definitions are based on standardized terms approved by the Institute of Radio Engineers, American Institute of Electrical Engineers, and the American Standards Association.

A consistent policy has been followed throughout in connection with the spelling and hyphenation of such compound terms as bandspread, blackbody, copper-oxide rectifier, cross-modulation, p-i-n diode, pre-tr tube, and servomotor, offering a style for use in writing and editing.

Mr Cooke is president of the Cooke Engineering Company, and Mr Markus is technical director of the Dictionary Department, McGraw-Hill Book Company.

STANDARDIZATION APPLIED. Proceedings, Ninth Annual Meeting, 1960. Standards Engineers Society, 1025 Connecticut Avenue, N.W., Washington 6, D.C. 8½ x 11 in. 86 pp. Members $4.00. Nonmembers $5.00.

The free world will not be able to meet the threat of communistic economic competition unless it combines forces to obtain the greatest possible productivity, and one requirement for such accomplishment is standardization. This was emphasized by Richard G. Munroe, president of the Standards Engineers Society, in his address at the Ninth Annual Meeting of the Society. The paper is one of those included in the published proceedings of the meeting. In other papers, outstanding authorities from both industry and government describe the present application of their own standards. Some of the important papers include an analysis of the psychological factors for and against the use of standards; how to analyze, classify, and prepare before starting a standards program; the kind of standards necessary for computers; and an analysis of better engineering writing.

The Standards Engineers Society is a society of professional standards engineers from companies, associations, societies, and government organizations. Sixteen regional sections of the Society are active in all parts of the United States, and include two in Canada and one in England. The Society also has members in Australia, Burma, Germany, India, Netherlands, Scotland, South Africa, Sweden, England, Venezuela, and Wales.

AMERICAN STANDARDS

Just Published . . .

If your company is a member of the American Standards Association, it is entitled to receive membership service copies of these newly published American Standards. The ASA contact in your company receives a bimonthly announcement of new American Standards, which also serves as an order form. Find out who your ASA contact is and order your American Standards through him. He will make sure your company receives the service to which it is entitled.

BUILDING AND CONSTRUCTION

Fireclay-Base Castable Refractories for Boiler Furnaces and Incinerators, Specification for, ASTM C 213-58; ASA A111.34-1961 (Revision of ASTM C 213-55; ASA A111.34-1955) $0.30

Covers fireclay-base castable refractory products which, when tempered with water, will develop structural strength by reason of hydraulic set. Provides basis for selection of castable refractories for use in certain locations in construction and repair of boiler furnaces and incinerators.

Sponsor: American Society for Testing Materials

ELECTRIC AND ELECTRONIC

Rigid Aluminum Conduit, Specification for, C80.5-1960 $0.50

Requirements for aluminum conduit, as well as couplings, elbows, bends, and nipples used as a raceway for wires or cables of an electrical system. Includes specifications for materials, threads, ductility, dimensions, and weight.

Sponsor: American Iron and Steel Institute

HIGHWAY TRAFFIC

Method of Recording and Measuring Motor Vehicle Fleet and Passenger Accident Experience, D15.2-1960 $0.80

Definitions of motor vehicle fleet accident and motor vehicle fleet passenger accident; evaluation of exposure to accidents in terms of mileage, number of passengers, and passenger miles; method for computing frequency of motor vehicle fleet accidents (same as in D15.1), frequency of passenger accidents and a supplementary rate based on total passenger miles; instructions for the classification of special cases.

Sponsors: National Safety Council; American Trucking Associations

MECHANICAL

Bearing Mounting Accessories, Specifications for, B3.9-1960 (Revision of B3.9-1951) $1.80

Sponsor: Anti-Friction Bearing Manufacturers Association

Standard Shapes and Sizes of Grinding Wheels, B74.2-1960 $1.50

Covers basic shapes and sizes of grinding wheels classified in accordance with their intended use. Diamond wheels, mounted wheels, abrasive discs, and plate-mounted wheels are not covered.

Sponsor: Grinding Wheel Institute

SAFETY

Safety Code for Elevators, Dumbwaiters, and Escalators, A17.1-1960 (Revision of A17.1-1955 and A17.1a-1957) $3.75

Safety requirements for the design, construction, installation, operation, inspection, testing, maintenance, alteration, and repair of passenger and freight elevators, dumbwaiters, escalators, private residence elevators and inclined lifts and their hoistways.

Sponsors: American Institute of Architects; American Society of Mechanical Engineers; National Bureau of Standards

In Process . . .

As of March 16, 1961

ACOUSTICS, VIBRATION, AND MECHANICAL SHOCK

American Standard Approved

Design, Construction, and Operation of Variable Duration, Medium-Impact Shock-Testing Machine for Lightweight Equipment, Specification for, S2.1-1961

Sponsors: Acoustical Society of America; American Society of Mechanical Engineers

BUILDING AND CONSTRUCTION

American Standard Approved

Door and Frame Preparation for Mortise Door Locks, Specifications for, A115.1-1961 (Revision of A115.1-1959)

Sponsor: National Builders' Hardware Association

In Standards Board

Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units, Specifications for, ASTM C 126-60T; ASA A101.1- (Revision of ASTM C 126-59T; ASA A101.1-1960)

Sponsor: American Society for Testing Materials

Asphalt-Saturated Roofing Felt for Use in Waterproofing and in Constructing Built-Up Roofs, Specifications for, ASTM D 226-60; ASA A109.2- (Revision of ASTM D 226-56; ASA A109.2-1956)

Asphalt-Saturated Asbestos Felts for Use in Waterproofing and in Constructing Built-Up Roofs, Specifications for, ASTM D 250-60; ASA A109.4- (Revision of ASTM D 250-56; ASA A109.4-1956)

Woven Cotton Fabrics Saturated with Bituminous Substances for Use in Waterproofing, Specifications for, ASTM D 173-60; ASA A109.12- (Revision of ASTM D 173-44; ASA A109.12-1955)

Sponsor: American Society for Testing Materials

Refractory Materials, Methods of Chemical Analysis, ASTM C 18-60; ASA A111.2- (Revision of ASTM C 18-52; ASA A111.2-1955)

Sponsor: American Society for Testing Materials

CONSUMER GOODS

In Standards Board

Liquid Toilet Soap, Specifications for, ASTM D 799-60T; ASA K60.14- (Revision of ASTM D 799-51; ASA K60.-14-1952)

Sponsor: American Society for Testing Materials

ELECTRIC AND ELECTRONIC

American Standard Approved

Nomenclature for Glass Bulbs Intended for Use with Electron Tubes and Electric Lamps, C79.1-1961 (Revision of C79.1-1958)

Sponsor: Electrical Standards Board

In Board of Review

Sampling Electrical Insulating Oils, Methods of, ASTM D 923-59; ASA C59.21- (Revision of ASTM D 923-56; ASA C59.21-1958)

Ozone-Resistant Rubber Insulating Tape, Specification for, ASTM D 1373-59T; ASA C59.37- (Revision of ASTM D 1373-57T; ASA C59.37-1958)

Sponsor: American Society for Testing Materials

In Standards Board

Wet-Process Porcelain Insulators (Suspension Type), C29.2- (Revision of C29.2-1955)

Wet-Process Porcelain Insulators (Spool Type), C29.3- (Revision of C29.3-1955)

Wet-Process Porcelain Insulators (Strain Type), C29.4- (Revision of C29.4-1955)

Wet-Process Porcelain Insulators (Low- and Medium-Voltage Pin Type), C29.5- (Revision of C29.5-1955)

Wet-Process Porcelain Insulators (High-Voltage Pin Type), C29.6- (Revision of C29.6-1955)

Wet-Process Porcelain Insulators (High-Voltage Line-Post Type), C29.7- (Revision of C29.7-1955)

Wet-Process Porcelain Insulators (Apparatus-Cap and Pin Type), C29.8- (Revision of C29.8-1957)

Wet-Process Porcelain Insulators (Apparatus-Post Type), C29.9- (Revision of C29.9-1957)
Sponsor: Electrical Standards Board

Schedules of Preferred Ratings for Power Circuit Breakers, C37.6- (Revision of C37.6-1959)
Sponsor: Electrical Standards Board

American Standard Reaffirmed

Rated Control Voltages and Their Ranges for Low-Voltage Air Circuit Breakers, C37.15-1954 (R1961)
Sponsor: Electrical Standards Board

Withdrawal Being Considered

Fabricating Laminated Plastics, Practice for, C59.17-1949
Sponsor: American Society for Testing Materials

Electron Tubes, Methods of Testing, C60.5-1952

Gas-Filled Radiation Counter Tubes, Methods of Testing, C60.11-1954

Noise in Electron Devices, Methods of Measuring, C60.13-1954
Sponsor: Electron Tube Council of the Joint Electron Device Engineering Council

MATERIALS AND TESTING

In Standards Board

Rockwell Hardness of Plastics and Electrical Insulating Materials, Method of Test for, ASTM D 785-60T; ASA K65.3- (Revision of ASTM D 785-51; ASA K65.3-1959)

Specific Gravity of Plastics, Methods of Test for, ASTM D 792-60T; ASA K65.8- (Revision of ASTM D 792-50; ASA K65.8-1959)
Sponsor: American Society for Testing Materials

MECHANICAL

In Board of Review

Multiple V-Belt Drives, Specifications for, B55.1-
Sponsors: American Society of Mechanical Engineers; National Machine Tool Builders' Association

In Standards Board

Addendum B3.11a- to American Standard Method of Evaluating Load Ratings for Ball and Roller Bearings, B3.11-1959
Sponsor: Anti-Friction Bearing Manufacturers Association

Free-Cutting Brass Rod, Bar, and Shapes for Use in Screw Machines, Specifications for, ASTM B 16-60; ASA H8.1- (Revision of ASTM B 16-58; ASA H8.1-1959)
Sponsor: American Society for Testing Materials

METALLURGY

In Standards Board

Zinc-Coated (Galvanized) Steel Tie Wires, Specification for, ASTM A 112-59; ASA G8.4- (Revision of ASTM A 112-33; ASA G8.4-1935)

Zinc Coating (Hot-Dip) on Iron and Steel Hardware, Specifications for, ASTM A 153-60; ASA G8.14- (Revision of ASTM A 153-59; ASA G8.14-1959)
Sponsor: American Society for Testing Materials

Uncoated Wrought Iron Sheets, Specifications for, ASTM A 162-60T; ASA G23.1- (Revision of ASTM A 162-39; ASA G23-1939)
Sponsor: American Society for Testing Materials

Gray Iron Castings, Specifications for, ASTM A 48-60T; ASA G25.1- (Revision of ASTM A 48-56; ASA G25.1-1956)
Sponsor: American Society for Testing Materials

Nickel-Steel Plates for Boilers and Other Pressure Vessels, Specifications for, ASTM A 203-60; ASA G33.1- (Revision of ASTM A 203-56; ASA G33.1-1956)
Sponsor: American Society for Testing Materials

Mild-to-Medium-Strength Carbon-Steel Castings for General Application, Specifications for, ASTM A 27-60; ASA G50.1- (Revision of ASTM A 27-58; ASA G50.1-1959)
Sponsor: American Society for Testing Materials

High-Strength Steel Castings for Structural Purposes, Specifications for, ASTM A 148-60; ASA G52.1- (Revision of ASTM A 148-58; ASA G52.1-1959)
Sponsor: American Society for Testing Materials

Electrodeposited Coatings of Lead on Steel, Specifications for, ASTM B 200-60; ASA G53.8- (Revision of ASTM B 200-55T; ASA G53.8-1956)
Sponsor: American Society for Testing Materials

MISCELLANEOUS

In Standards Board

Thermometers, Specifications for, ASTM E 1-60; ASA Z71.1- (Revision of ASTM E 1-60; ASA Z71.1-1960)
Sponsor: American Society for Testing Materials

Reaffirmation Being Considered

Rules for Rounding Off Decimal Values, Z25.1-1940 (R1947)

PHOTOGRAPHY

American Standard Approved

Speed of Reversal Color Films for Still Photography, Method for Determining, PH2.21-1961
Sponsor: Photographic Standards Board

In Board of Review

Selective Transmission of a Photographic Lens, Test Method for, PH3.37-
Sponsor: Photographic Standards Board

Converting Weights and Measures for Photographic Use, Method for, PH4.6- (Revision of PH4.6-1953)

Bite of Film-Processing Clips for Roll and Dental Films, Dimensions for, PH4.15- [Revision of PH4.15-1945 (R1954)]
Sponsor: Photographic Standards Board

In Standards Board

Total Hardness of Water for Photographic Processing, Method for Determining, PH4.28-

Photographic Grade Ammonium Chloride, Specification for, PH4.183- (Revision of PH4.183-1953)

Photographic Grade Ammonium Sulfate, Specification for, PH4.184- (Revision of PH4.184-1953)

Photographic Grade Sodium Carbonate, Monohydrate, Specification for, PH4.-227- (Revision of PH4.227-1954)

Photographic Grade Sodium Carbonate, Anhydrous, Specification for, PH4.228- (Revision of PH4.228-1954)

Photographic Grade Sodium Tetraborate, Decahydrate, Specification for, PH4.-230- (Revision of PH4.230-1954)

Photographic Grade Sodium Metaborate, Octahydrate, Specification for, PH4.-231- (Revision of PH4.231-1954)

Photographic Grade Sodium Tetraborate, Pentahydrate, Specification for, PH4.-233- (Revision of PH4.233-1954)

Photographic Grade Sodium Sulfite, Anhydrous, Specification for, PH4.275- (Revision of PH4.275-1952)
Sponsor: Photographic Standards Board

American Standard Reaffirmed

Radiographic Intensifying Screens, Dimensions for, PH3.19-1954(R1961)
Sponsor: Photographic Standards Board

PIPE AND FITTINGS

In Standards Board

Standard Strength Unglazed Clay Pipe, Specifications for, ASTM C 261-60T; ASA A106.4- (Revision of ASTM C 261-59T; ASA A106.4-1960)

Clay Pipe, Methods of Testing, ASTM C 301-60T; ASA A106.5- (Revision of ASTM C 301-55; ASA A106.5-1955)
Sponsor: American Society for Testing Materials

AMERICAN STANDARDS PROJECTS

Mounting Dimensions of Door Locks and Flush Bolts, A115—

Sponsor: National Builders Hardware Association

A new drawing and several minor dimensional changes have been approved as a revision of American Standard A115.1-1959, Specifications for Door and Frame Preparation for Mortise Door Locks.

The drawing (Figure 1-1) had proved to be difficult to interpret because both lock dimensions and door preparation dimensions were included. Therefore, the figure has been completely revised for clarification. The only changes in dimensions are: (1) the space between lock supports has been corrected to read 59/64 in place of 53/64; (2) lock depth dimensions have been altered to reflect maximum and minimum allowable tolerance.

It is expected that the new edition will soon be available.

American Standards A115.2-1959 and A115.4-1959 should be corrected as follows:

A115.2-1959, paragraph 2-2.3, line 10. Dimension 3/32 should read 5/32.

A115.4-1959, Figure 4-1, upper left-hand corner, title "Strike Preparation in Frame." Dimensions from strike edge to center line now reading 7/16 in. should read 15/32 in.

Correction sheets will soon be available to insert in copies of these two standards.

Pipe Threads, B2—

Sponsors: American Gas Association; American Society of Mechanical Engineers

The following correction to American Standard Pipe Threads (Except Dryseal), B2.1-1960, has been called to our attention:

On page 13, Table 4, change the first two values under "Minor Diameter" to read 0.340 and 0.442.

Code for Pressure Piping, B31—

Sponsor: The American Society of Mechancial Engineers

Interpretations submitted by the sponsor.

From time to time certain actions of Sectional Committee B31 are published for the information of those interested. These do not constitute formal revision of the Code, but they may be used in specifications, or otherwise, as representing the considered opinions of the committee.

Pending revision of the Code for Pressure Piping, B31.1-1955, the sectional committee has recommended that ASME, as sponsor, and ASA publish selected interpretations so that industry may take immediate advantage of the corresponding proposed revisions.

CASE NO. 32 (Reopened)

Inquiry: Is the use of centrifugally cast carbon steel, low alloy, and austenitic stainless pipe permissible under American Standard B31.3-1959, Petroleum Refining Piping, Code for Pressure Piping?

Reply: It is the opinion of the committee that centrifugally cast pipe is suitable for use in piping systems under American Standard B31.3-1959, Code for Pressure Piping, if the following requirements are met:

1. The pipe materials shall meet the requirements of ASTM Specification A216, A351, A426, or A426 modified to exclude the requirements for ultrasonic inspection.

2. Piping made of materials conforming to A216 and A351 shall have both the inner and outer surfaces machined to a finish not coarser than 250 rms after heat treatment.

3. Each piece of pipe made of materials conforming to A216 and A351 shall be examined on the inside and outside surfaces by a magnetic particle method or a liquid penetrant method of surface inspection whichever is feasible for the material after machining of the inside and outside surfaces, including the ends, and after hydrostatic test. When magnetic particle inspection is used, it shall be made in accordance with the Method for Dry Powder Magnetic Particle Inspection (ASTM E109), or by a wet method agreed upon by a manufacturer and purchaser. The details of the liquid penetrant method shall be a matter of agreement between the manufacturer and purchaser. Any crack-like or other injurious defects revealed by these methods shall be repaired.

4. When specified in the engineering design, each piece of pipe shall be ultrasonically or radiographically tested throughout its length after machining to determine its soundness. When pipe is tested ultrasonically, discontinuities in excess of 5 percent of the wall thickness shall be cause for rejection or repair. Either the shear or longitudinal methods of ultrasonic testing shall be used. When pipe is tested radiographically, defects as judged by the industrial radiographic standards for steel casting (ASTM E71, Class II) shall be cause for rejection or repair. (It should be recognized that austenitic casting may not be amenable to ultrasonic inspection.)

5. Each length of pipe made of material conforming to Specification A216 and A351 shall be tested after machining by the manufacturer to a hydrostatic test pressure which will produce in the pipe at atmospheric temperature a stress of 60 percent of the specified minimum yield strength. This pressure shall be determined by the formula:

$$P = 2st/D$$

where:

P = minimum hydrostatic test pressure (pounds per square inch).

s = 60 percent of the specified minimum yield strength or yield point.

t = actual wall thickness, inches.

D = outside diameter of pipe, inches.

The test shall be maintained for not less than five (5) minutes.

6. Flattening tests on pipe intended for bending shall be as prescribed in Specification A426-58T with following values of "e" to be used where applicable:

A216	.07
A351 (austenitic)	.09
A351 (ferritic)	.07

7. The wall thickness of the casting shall be determined in accordance with the applicable paragraphs of Chapter II, Part 2 of the American Standard B31.3-1959 code except that the permissible stress values shall be as shown in the appended table. To arrive at the "S" value, the appropriate casting quality factors in Paragraph 8 below shall be applied.

NOTE: The stress tables should show the allowable stresses for materials without any casting factor.

8. The following casting quality factors shall govern:

(a) Minimum requirements of this case (including machining inside and

outside plus magnetic particle inspection or liquid penetrant) 90%
(b) 100 percent ultrasonic or 100 percent radiographic inspection in addition to requirements in (a) above 100%
9. The foregoing requirements establish interim provisions for A351 and A216 until such time as further ASTM specifications on centrifugally cast pipe become available and are accepted by the committee.

CASE NO. 49—Code Section to be Used for Chemical Industry Piping

Inquiry: Is there a code section of American Standard B31.3-1959, Petroleum Refinery Piping (Code for Pressure Piping), by which chemical process industry piping may be designed, fabricated, inspected, and tested?

Reply: It is the opinion of the committee that until such time as an American Standard pressure piping code section specifically applying to chemical process piping has been published, chemical process piping may be designed, fabricated, inspected, and tested in accordance with the requirements of American Standard B31.3-1959, Petroleum Refinery Piping.

CASE NO. 50—Allowable Stresses for Material Listed in B31.1-1955

Inquiry: Section 1 of American Standard B31.1-1955, Code for Pressure Piping, lists allowable stresses for only a limited number of piping materials. What stresses may be used for those materials listed in Table 1 for which no stresses are given?

Reply: It is the opinion of the committee for Section 1 of American Standard B31.1-1955, Code for Pressure Piping, that where it is desired to use materials mentioned in the above inquiry, the stresses given in the ASME Section 1, Power Boiler Code, apply. The intent of the Code for Pressure Piping will be met inasmuch as the basis for establishing stresses set forth in Table P-7 of the ASME Section 1, Power Boiler Code, has been adopted as the basis used under the requirements of Section 1 of the Code for Pressure Piping.

V-Belts and V-Belt Drives, B55—

Sponsors: American Society of Mechanical Engineers; National Machine Tool Builders' Association

A new American Standard, Specifications for Multiple V-Belt Drives, has just been approved by ASA. Dimensions and horsepower ratings of V-belts and sheaves in the A, B, C, D, E series, for industrial use, are covered. Automotive, agricultural, and appliance applications are not included.

The proposed standard is based on *Engineering Standards, Multiple V-belt Drives* (1955 edition), published jointly by the Multiple V-Belt Drive and Mechanical Power Transmission Association and the Rubber Manufacturers Association, Inc. However, two significant changes have simplified the standard: (1) The number of preferred belt lengths was reduced from 49 to 38; (2) Tabulation of horsepower ratings was reduced from two ("standard quality" and "premium quality") to one, which is the standard. Ratings are equal to the former premium values.

Use of the Decimalized Inch, B87—

Sponsor: American Society of Tool and Manufacturing Engineers

This new sectional committee, set up to "define the decimalized inch and to present preferred system(s) for its application," held its organization meeting February 3.

Roy P. Trowbridge, General Motors Corporation, is chairman, with Colonel Leslie S. Fletcher, research director, ASTME, as secretary.

Col. Leslie S. Fletcher

Although one major automobile company had adopted the decimal system in the early 1930s, the major swing to decimals by other automotive companies and by other large manufacturers has taken place in the postwar years, the chairman pointed out. Use of the decimal inch is becoming increasingly important, particularly because computers which are so rapidly coming into use, cannot store fractions. The use of decimals does not imply the use of close tolerances. If anything, the proper use of decimals allows the designer to specify broader tolerances if he so desires, Mr Trowbridge explained.

Seven subcommittees were organized to make recommendations on material to be covered in the standard.

1. To study terminology for subdivisions and multiples of the inch.
2. To investigate the desirability and feasibility of the decimalization of the circle.
3. To make recommendations on the rejection of parts because of variations outside of the specified limits, i.e., if limits are given as 1.02-1.00, should parts made to 1.021 or .999 be rejectable?
4. To prepare a foreword for the proposed standard describing briefly the history of the inch, the conversion factor to the millimeter, and explaining why this standard is needed.
5. To recommend wording for the purpose, scope, and definitions as required.
6. To make recommendations on the preferred systems, square measure, volumetric measure, use of systems in combination, and conversion of common fractions to decimals.
7. To consider and report on points which should be covered in appendixes of the standard.

It is planned to hold the next meeting of the committee in May.

Photographic Reproduction of Documents, PH5—

Sponsor: American Library Association

Ernest P. Taubes, president of Photo Devices, Inc, Rochester, N.Y., has just become vice-chairman of Sectional Committee PH5. Donald C. Holmes, chief of the Photo Duplication Service, Library of Congress, is continuing as chairman of the committee, and Hubbard W. Ballou, head of Photographic Services, Columbia University Library, New York, as secretary.

Mr Taubes was educated at the University of Zurich and the University of Vienna, and has a Masters Degree in Electrical and Mechanical Engineering, and is a Doctor of Technical Sciences. He has been in the photographic design and manufacturing field for close to 20 years.

For ten years he was president of Microtronics Corporation, of which he was a joint founder, and for several years was a vice-president of Photostat. He organized Photo Devices, Inc, in 1956, as a research and engi-

neering service for the photographic industry.

Concerning the work of Sectional Committee PH5, and its Subcommittee 1 on Microtransparencies, of which he is chairman, Mr Taubes comments: "In line with the tremendous upswing of microfilm applications, our committee, and specifically PH5-1, has embarked on a broad program of standardization which includes all phases of microfilming and microfilm equipment. At the last meeting, February 17, in Rochester, N.Y., a number of working groups were appointed to prepare the necessary standards and examine all the data available for such standards.

"For the last four years, the main effort has been concentrated on establishing a standard of quality for microtransparencies. This has required the preparation of considerable test material to prove the limits of legibility for microfilm images."

Ernest P. Taubes

Industrial Cooling Towers, B76—

Sponsors: American Society of Mechanical Engineers; Air Conditioning and Refrigeration Institute; Cooling Tower Institute

The scope for the work of Committee B76 has been approved as: "The establishment of standards for cooling towers. In establishing these standards, consideration should be given to: 1. Performance test procedures taking into account possible differences in requirements for testing field-erected towers and factory-assembled towers; 2. Materials for construction taking into consideration preservation methods and water quality specifications as recommended practice; 3. Mechanical components furnished as part of a cooling tower, except pumps; 4. Safety requirements in the design and assembly of a cooling tower; 5. Performance analysis."

STANDARDS ALIVE

A Guest Column

by HENDLEY BLACKMON

BECAUSE THE DEVELOPMENT of sound electrical standards is a prime economic investment for America, the National Electrical Manufacturers Association, as part and parcel of our free enterprise system, strongly supports the work of ASA in providing the facilities for formulating standards for voluntary use by industry.

American Standards are important to the manufacturers of electrical equipment in all phases of their business. Through the facilities of ASA, purchasers of all kinds of electrical equipment and representatives of NEMA meet together with representatives of government and general-interest groups concerned, and, on a private-enterprise basis, develop standards that are mutually acceptable. This ensures wide use of the standard among users as well as among producers.

Standards developed in this manner provide many economic benefits, including the extremely important function of establishing a "common language" between the customer and the manufacturer, thus minimizing misunderstandings and economic waste. In addition, they are the foundation upon which mass production rests; they are essential in the economic procurement of materials used in the manufacturing process; and they contribute substantially to economy in design, production, and distribution of all kinds of electrical products.

In addition to participating in all the ASA sectional committee activities in which NEMA is interested and securing the preceding benefits, NEMA presently is working toward elimination of duplication of standards activities by organizations in the electrical field. The electrical manufacturers foresee great future benefits in this approach, which is made practicable only because of the unique facilities of ASA services. For example, NEMA is currently arranging for all parties at interest who have proprietary standards on transformers to utilize the C57 sectional committee for consolidating all existing standards, and thus provide an orderly procedure for their future development and maintenance. On successful completion of the venture, benefits for American industry will include: (1) a single authoritative document, eliminating present duplication and confusion in transformer standards; (2) concentration of the work in one place, saving much time and money; and (3) unit cost reduction, thus widening use of the product and its value to industry. This principle, if broadly applied where multiple and conflicting standards exist in industry, has great potential economic significance.

In addition to domestic standards, NEMA participates actively in international electrical standardization, which again is made practicable only by the carefully organized procedures of ASA for collecting and harmonizing U.S. views.

Thus, basically, NEMA uses ASA services because this is one of the most efficient ways electrical manufacturers can economically help to increase American productivity and contribute to the over-all public good.

MR BLACKMON, engineering manager, Association Activities, Westinghouse Electric Corporation, is chairman, Codes and Standards Committee, National Electrical Manufacturers Association.